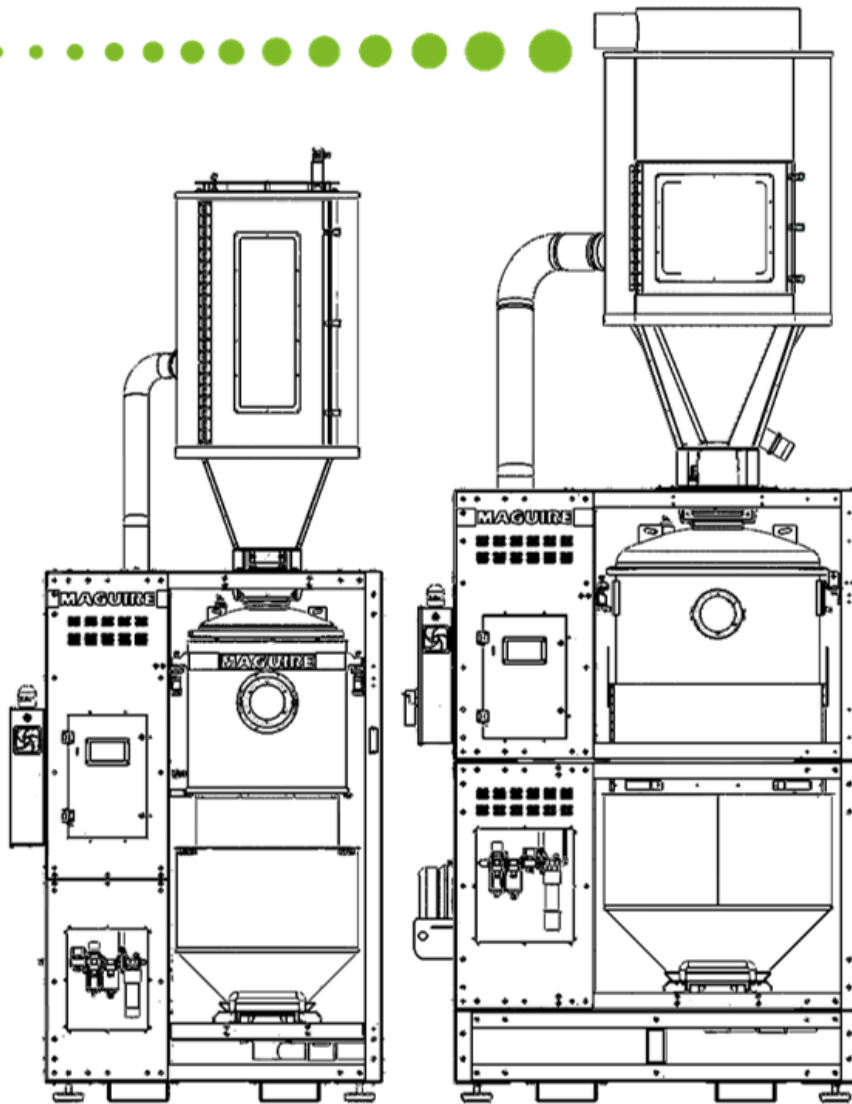


ULTRA[®]-600/1000

.....
BY MAGUIRE[®]



- INSTALLATION
- OPERATION
- MAINTENANCE

Integrated with

FlexBus Lite[®]

Receiver Control System

ULTRA-600® / ULTRA-1000® : Ultra-Low Energy Dryer

This document is the original Instruction manual of the Maguire ULTRA-600® and ULTRA-1000® Vacuum Dryer equipped with the Touchscreen Controller.

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The Maguire ULTRA series of dryers are CE certified in accordance with the relevant EU directives and EN Standards, current at the time of manufacture. Any modification or adjustment to the machines by the End User, without the express permission of the manufacturer, may invalidate the CE compliance of the dryer.

To every person concerned with use and maintenance of the Maguire ULTRA-600® and ULTRA-1000® it is recommended to read thoroughly these operating instructions. Maguire Products Inc. accepts no responsibility or liability for damage or malfunction of the equipment arising from non-observance of these operating instructions. The intended use of the Maguire ULTRA dryer series is specifically for raw pelletized plastics materials and recycled plastics materials and should not be used for applications outside of the intended use.

To avoid errors and to ensure trouble-free operation, it is essential that these operating instructions are read and understood by all personnel who are to use the equipment.

Should you have problems or difficulties with the equipment, please contact Maguire Products Inc. or your local Maguire distributor.

Manufacturer's Contact Information

Maguire Products Inc.
11 Crozerville Road
Aston, PA. 19014

Phone: (610) 459-4300
Fax: (610) 459-2700

Website: www.maguire.com

Email: info@maguire.com

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Warranty – Exclusive 5-Year

MAGUIRE PRODUCTS INC. OFFERS THE MOST COMPREHENSIVE WARRANTY in the plastics auxiliary equipment industry. We warrant each MAGUIRE ULTRA – Dryer manufactured by us to be free from defects in material and workmanship under normal use and service; excluding only those items listed below as 'excluded items'; our obligation under this warranty being limited to making good at our factory any Dryer which shall, within FIVE (5) YEARS after delivery to the original purchaser, be RETURNED intact to us, transportation charges PREPAID, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part, and MAGUIRE PRODUCTS neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sale of its Dryers.



This warranty shall not apply to equipment repaired or altered outside MAGUIRE PRODUCTS INC. factory, unless such repair or alteration was, in our judgment, not responsible for the failure; nor which has been subject to misuse, negligence or accident, incorrect wiring by others, or installation or use not in accord with instructions furnished by Maguire Products, Inc.

Our liability under this warranty will extend only to equipment that is returned to our factory in Aston, Pennsylvania, PREPAID.

Please note that we always strive to satisfy our customers in whatever manner is deemed most expedient to overcome any problems they may have in connection with our equipment.

UK/EC DECLARATION OF CONFORMITY

Original

**Manufacturer Business Name & Full Address**

Maguire Products, Inc.
11 Crozerville RD
Aston, PA 19014
USA

Authorized Representative (if applicable)

Hold Tech Files Ltd.
Dun Iseal, Newtown, Gaulsmill
Ferrybank, Waterford
X91F638
Republic of Ireland

Person Authorized to Compile the Technical File Name & Address: Hold Tech Files Ltd.

Machine Details

Model: **Description:** Vacuum Dryer

Serial #: **Electrical Information:** 400/3/50

I declare that the machinery fulfils all the relevant provisions of these Regulations: Supply of Machinery (Safety) Regulations 2008 as amended; Electromagnetic Compatibility Regulations 2016 as amended, and these Directives: Machinery Directive 2006/42/EC, Electromagnetic Compatibility Directive, 2014/30/EU.

Standards Used

EN ISO 12100:2010; EN ISO 4414:2010; EN ISO 11201:2010; EN ISO 13732-1:2008; EN ISO 13857:2008; EN ISO 14118:2018
EN ISO 14120:2015; EN 60204-1:2018.

Place of Declaration

Maguire Products, Inc.
11 Crozerville RD
Aston, PA, 19014, USA
USA

Date of Declaration 5th July 2021

Person empowered to draw up Declaration

Name: Mr. Stephen Maguire

Position: President

Signature: _____



Produced using Compliance Risk Software
www.compliancerisksoftware.co.uk

Declaration Number:

Safety Warnings



WARNING

HOT SURFACES:

As with all dryers, there are **HOT SURFACES** to avoid. Temperatures can reach 350°F (180°C).

Typically, these surfaces are not at dangerous temperatures, however all hot surfaces should be avoided.

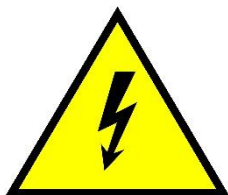


**Warning Label indicate:
HOT SURFACES**

USE CAUTION when removing
and installing canisters.

USE GLOVES

DO NOT REACH into the dryer
enclosure.



DANGER

RISK OF SHOCK:

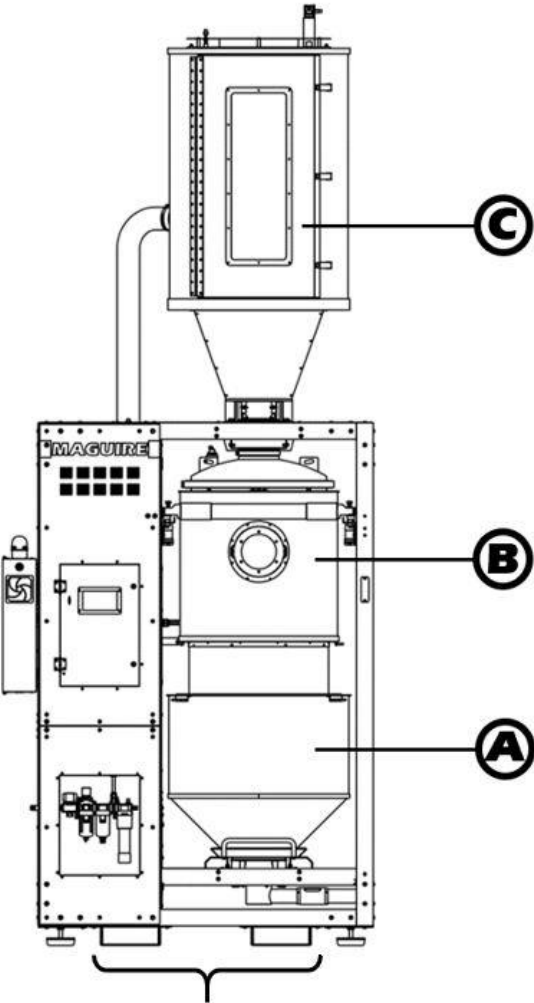
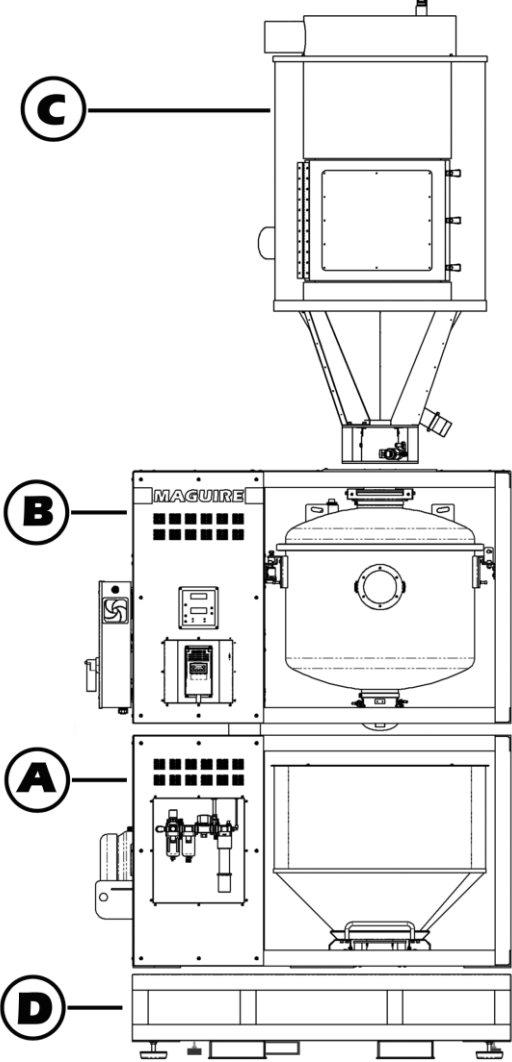
Disconnect power supply before servicing the
Dryer.



Transport and Setup

Shipment

The ULTRA-600 and ULTRA-1000 dryers are shipped as separate components that require re-assembly.

ULTRA-600	ULTRA-1000
Retention Hopper and Vacuum Chamber Assembly Frame (A & B) – The retention hopper (A) and vacuum chamber (B) assembly is identified by the large metal frame encompassing the recessed pneumatics cabinet, the electrical cabinet, the mounted vacuum chamber (B), and the removable material retention hopper (A). Total assembly weight is 1681 lb. (762 kg). Heating Hopper Assembly (C) – Located on top of the vacuum chamber/retention hopper assembly frame. Weight is 349 lb. (158 kg).  Forklift Channels	Retention Hopper and Vacuum Chamber Assembly (A & B) – The retention hopper subsection encompasses the retention hopper, slide rail system, and pneumatics bay (A). The vacuum chamber subsection encompasses the vacuum chamber, the control panel, and electrical cabinet (B). Total assembly weight is 2250 lb (1021 kg) Heating Hopper Assembly (C) – Located on top of the frame that encompasses the vacuum chamber and retention hopper. Weight is 509 lb (231 kg) Optional Sub Frame (D) – elevates the retention hopper assembly 16" (40.6 cm.) allowing material to be conveyed from the base (309lb. / 140 kg.). 

Lifting and Moving components of the Dryer

 WARNING	Ensure your lifting equipment is rated to lifting the weight of the individual sections of the ULTRA-600/1000.		Follow forklift safety rules and regulations whenever moving portions of the ULTRA-600/1000
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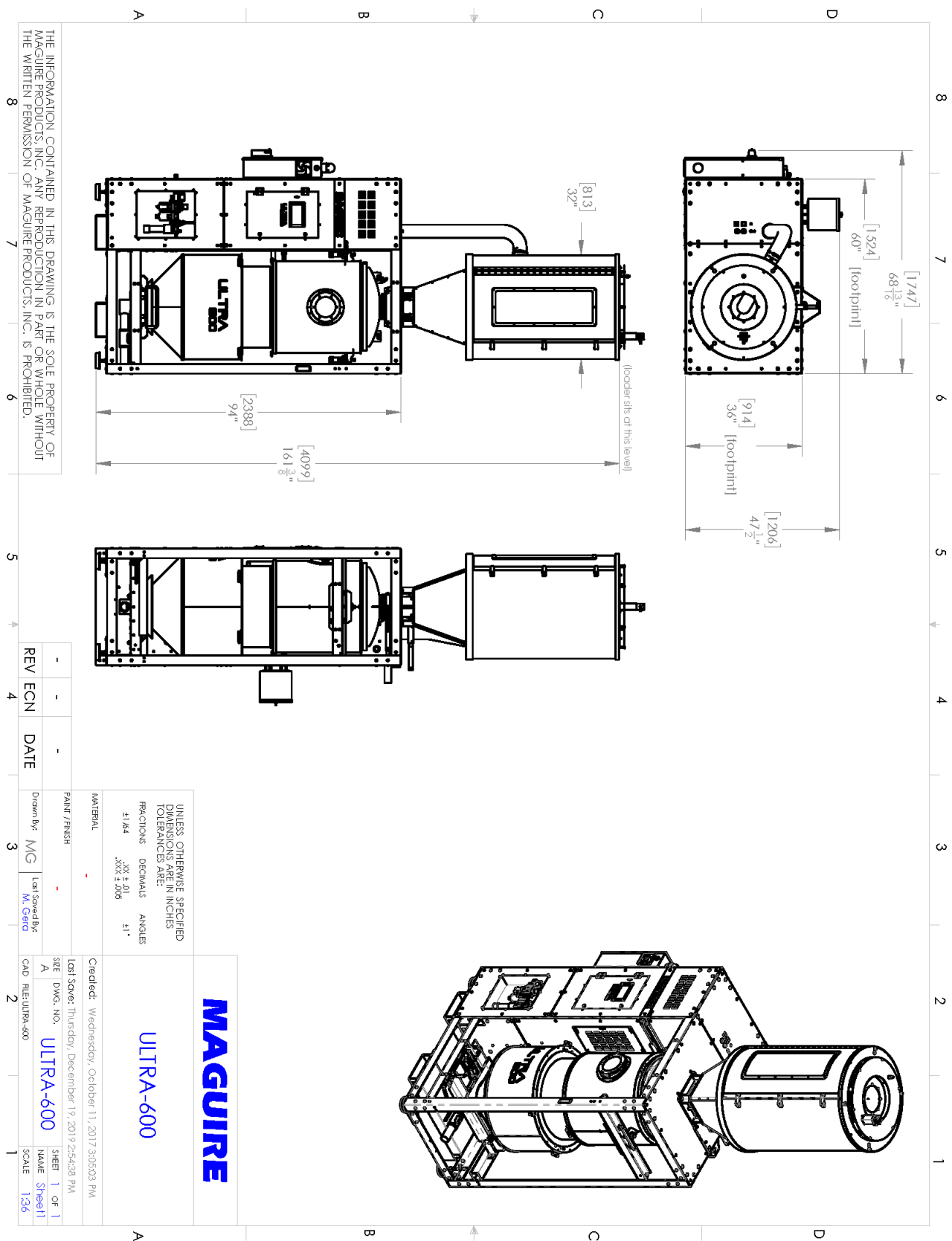
	ULTRA-600	ULTRA-1000
Complete Unit	1824 lbs. (827 kg.)	2950 lbs. (1338 kg.)
Heating Hopper	349 lbs. (158 kg.)	509 lbs. (231 kg.)
Vacuum Chamber	217 lbs. (98 kg.)	311 lbs. (141 kg.)
Retention Hopper	77 lbs. (35 kg.)	95 lbs. (43 kg.)
Sub Frame*	N/A	309 lbs. (140 kg.)

The ULTRA-600 platform is designed for ease of lifting and moving. The retention hopper and vacuum chamber assembly frame was designed with two steel channels spanning the depth of the machine to allow for a fork truck to safely and easily lift and position the machine into place.

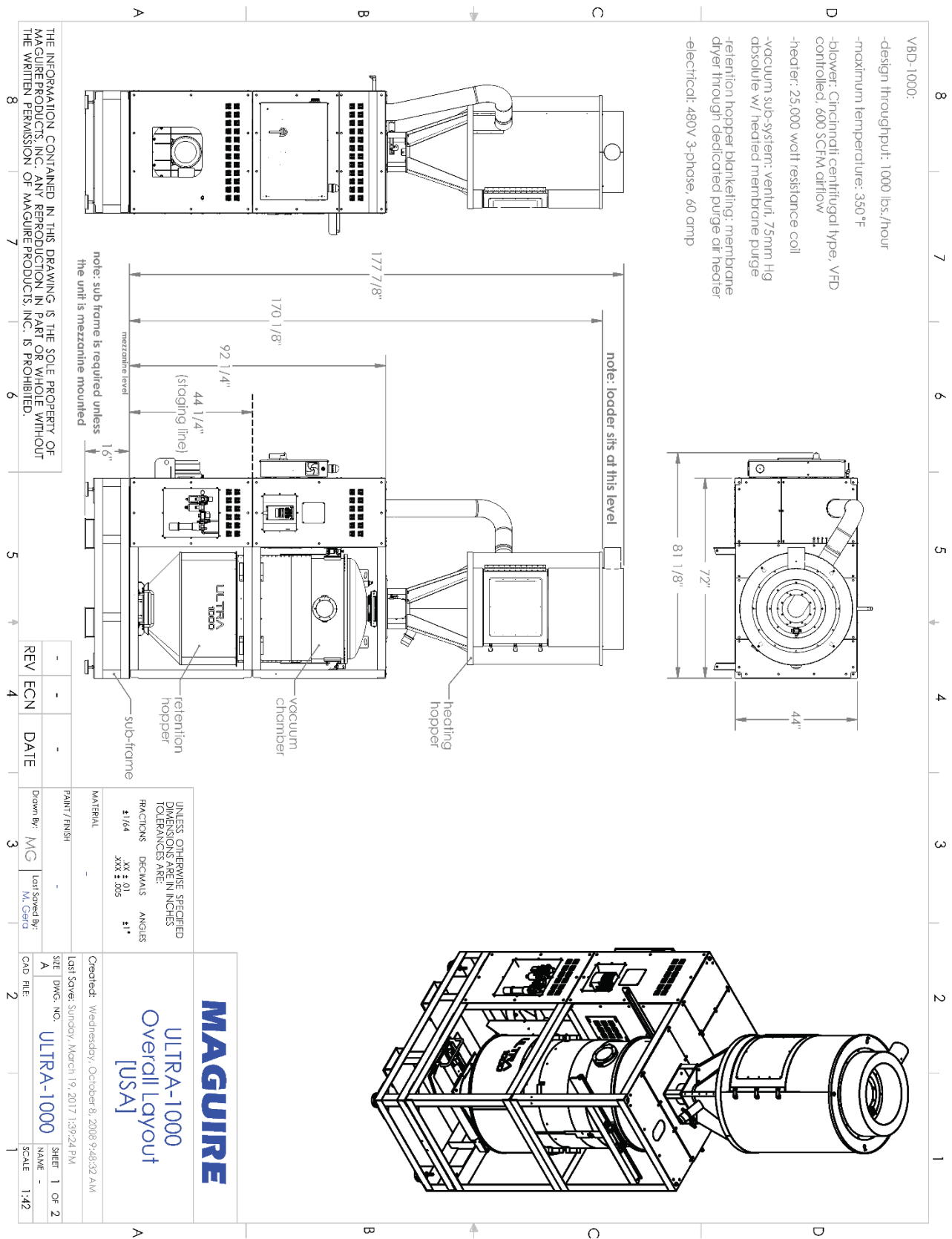


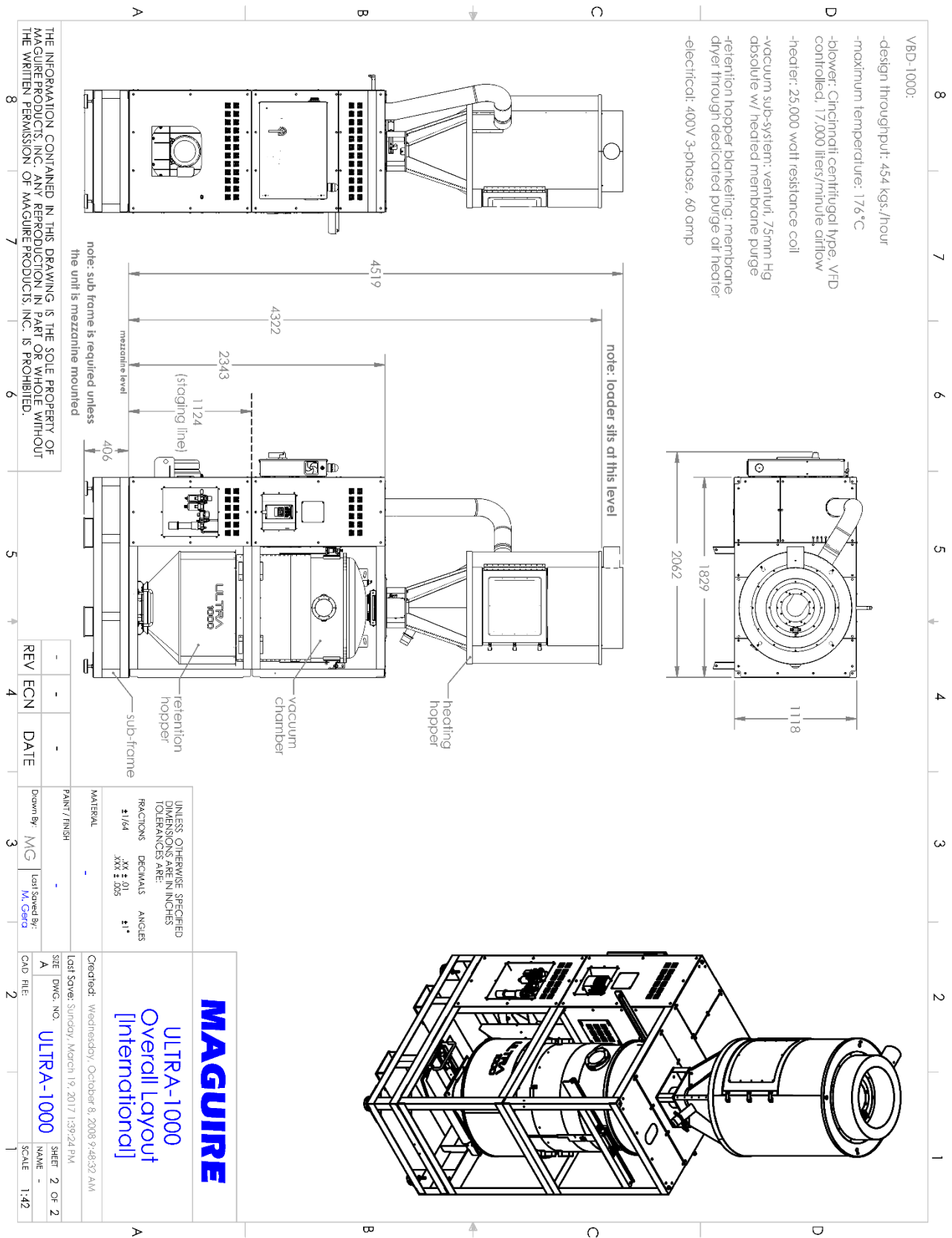
The ULTRA-1000, when equipped with the optional subframe, also has built-in forklift channels.

Overall Layout and Dimensions – ULTRA-600

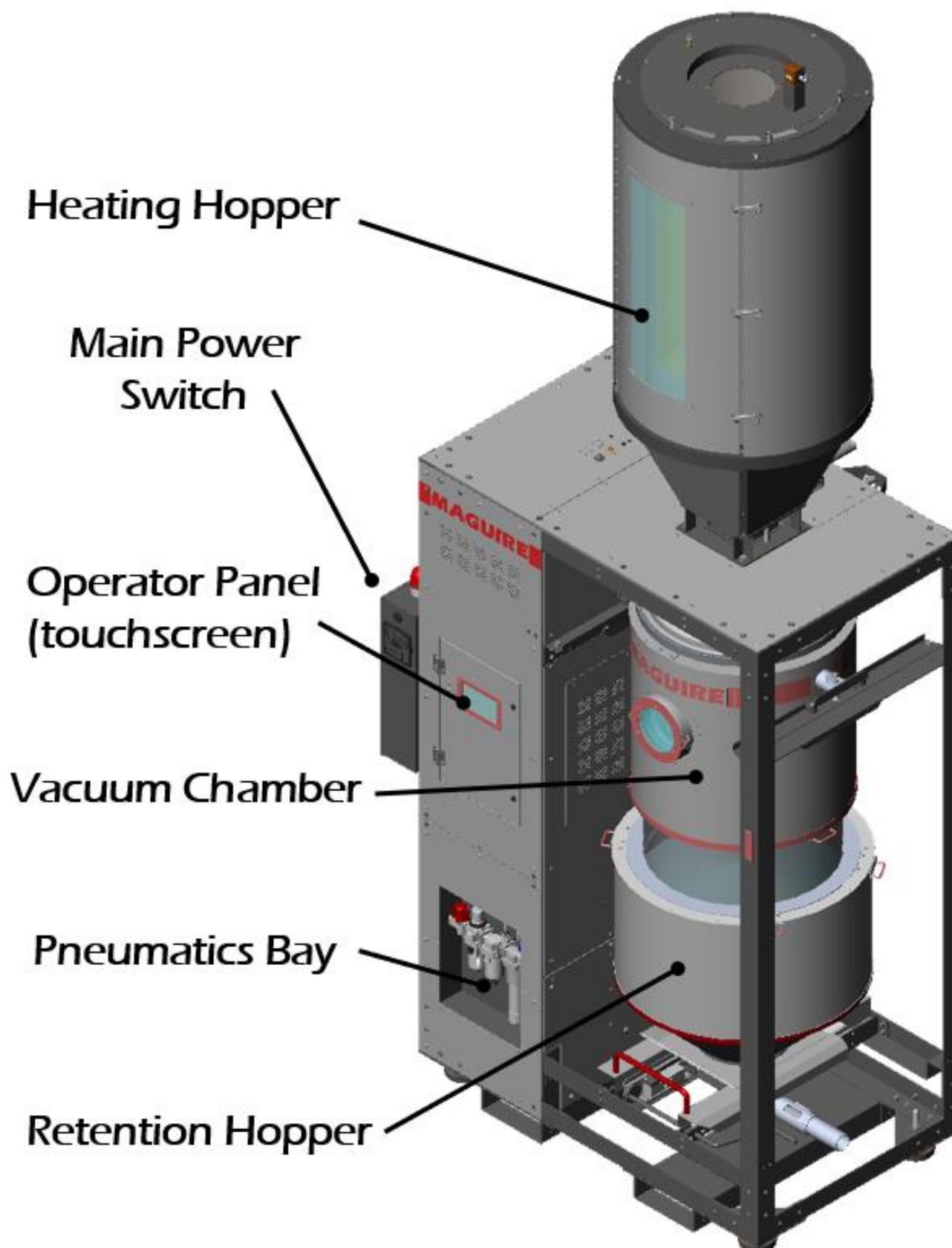


Overall Layout and Dimensions – ULTRA-1000

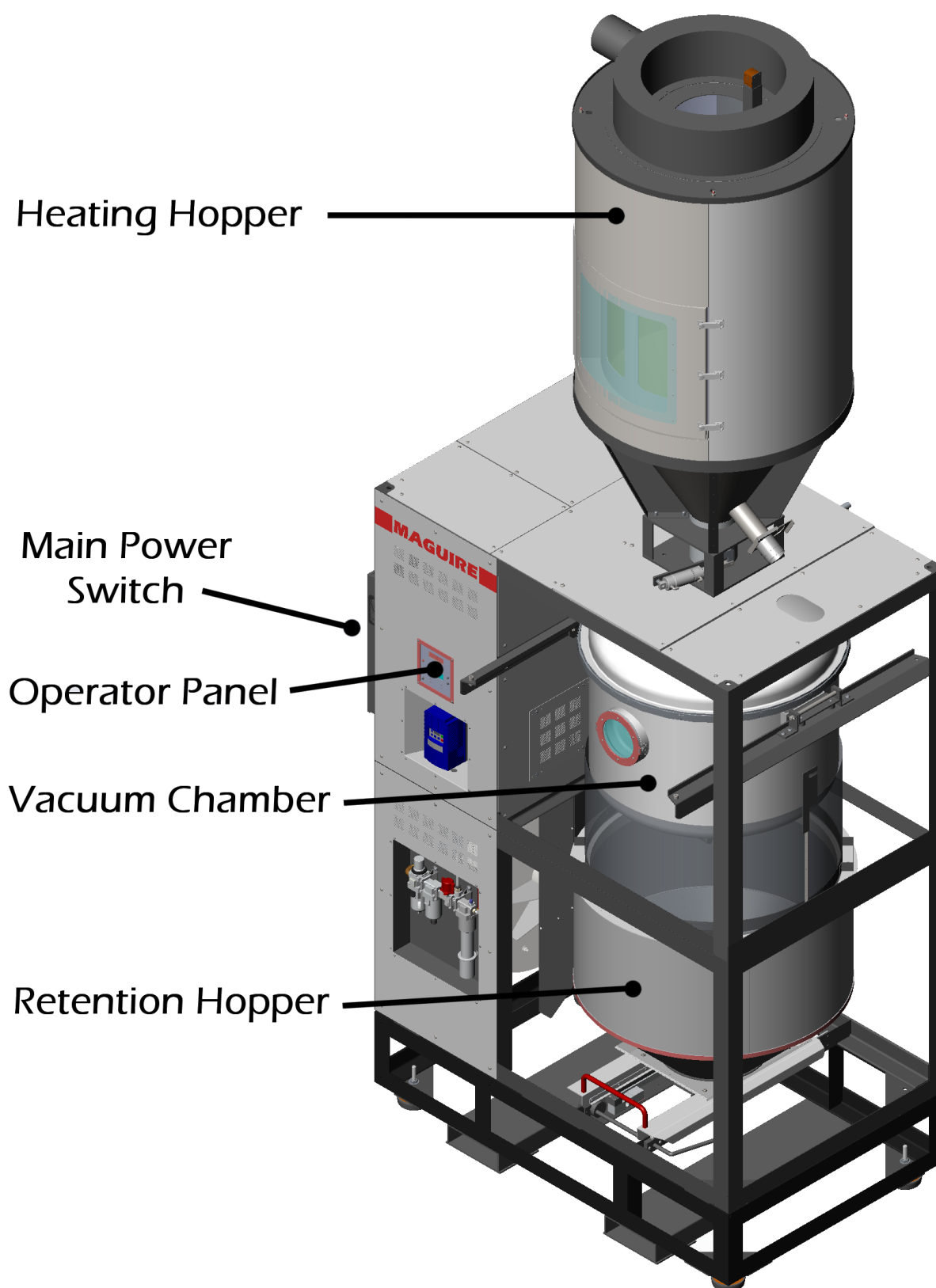




Machine Component Key – ULTRA-600



Machine Component Key – ULTRA-1000



Shipment Inventory

The ULTRA-600/1000 is shipped on two pallets. The main unit of the machine is reinforced with an external pallet system that keeps all four sides of the machine safe during shipment. The machine retains the vacuum chamber and retention hopper during shipping. Any loose items are packed inside a box, which is placed within the retention hopper. The heating hopper is separated from the machine and ships on a separate pallet.

Below is a list of loose components that are packaged inside the retention hopper; all of which will need to be installed prior to operation.

ULTRA-600:	ULTRA-1000:
• User Manual • Vacuum Fill Valve Drop Tube • Recollector Hopper Assembly • (2) ¼-20 wing Nuts (US only) • (2) ¼-20 low profile flex nuts (intl.) • 5" V.C Slide Gate Fill Valve Assy. • 4" OD Orange Heater Hose • 5" ID Hose Insulation Cover • (2) 4" Hose Clamps	• User Manual • 6" OD Orange Heater Hose • 8" ID Hose Insulation Cover • (2) 6" Hose Clamps



ULTRA Heating Hopper



ULTRA Dryer Machine

Assembly:

Optional Base Frame – ULTRA-1000 Only

The Base Frame is used to raise ULTRA-1000's Retention Hopper off the floor. Weight of the Base Frame is 1303 lb. (591 kg). Note: If the ULTRA is to be installed so that material is gravity fed out of the bottom of the dryer, then this Base Frame is not necessary.

Level Surface – It is crucial for the dryer to be placed on an adequately level surface. If the designated area is not level, the Base Frame will need to be shimmed.

Maguire Products, Inc. offers optional leveling pads, compatible with the base frame, to help with this process.



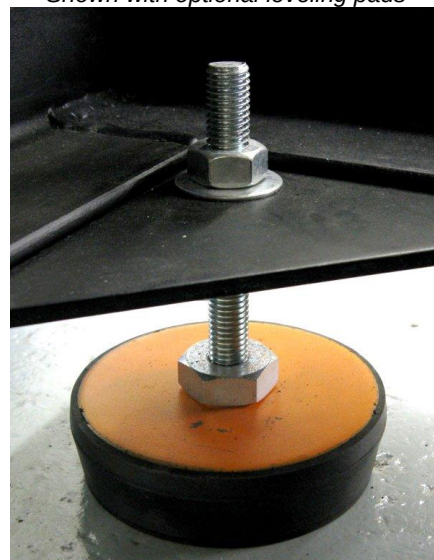
If using the optional leveling pads, make sure the surface that the ULTRA-600/1000 will be placed on can support the weight of the ULTRA at 4 corners. If the floor cannot support the weight in 4 small footprints, use leveling shims on the frame instead.



When adjusting the leveling pads, keep the frame as close to the floor as possible. Overextending the threads below the frame is not recommended for stability reasons.

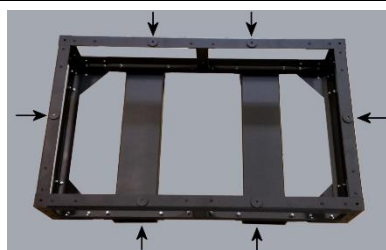


Shown with optional leveling pads



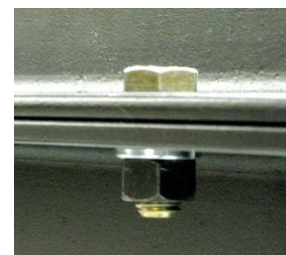
Installing Frame Assembly (Section A+B)

Set the 6 spacers at the locations shown below.



If using the Base Frame, lower the **Retention Hopper Assembly** onto the **Base Frame**. Secure the Retention Hopper Assembly to the Base Frame using the (10) 1/2-13 grade 8 bolts supplied.

If the Base Frame is not used – Lower the **Retention Hopper Assembly** (Section A) into place. The Retention Hopper Assembly must be leveled BEFORE installing the next section.

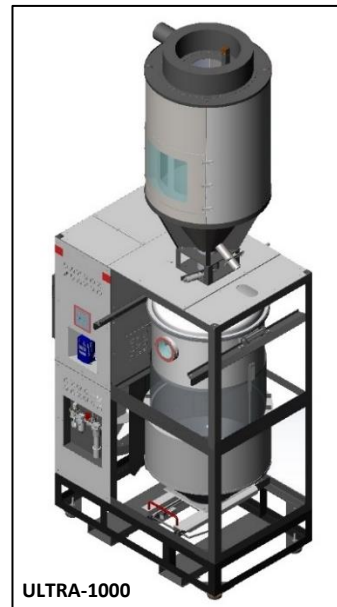
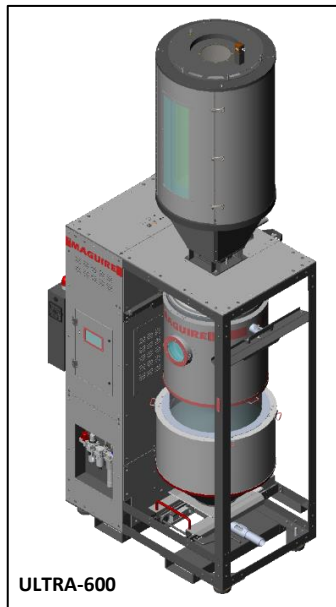


ULTRA-600

The optional leveling pads are also compatible with the ULTRA-600 to assist in the leveling process.

Heating Hopper – Installation

Following proper forklift safety regulations, carefully lift the heating hopper, by positioning the forks underneath the structural retaining ring. Place the heating hopper on top of the machine frame. Ensure that the front hatch of the heating hopper faces the same direction as the front of the machine.



Using the supplied hardware (1/2"-13 x 1-1/4" hex bolts), securely fasten down the heating hopper.

Level Sensor (Optional) – Installation

The ULTRA-600/1000 dryers can be equipped with an optional heating hopper level sensor. If not installed by the manufacturer, it needs to be attached to the level sensor column located on the top of the heating hopper. Ensure that the clear sensing window is facing DOWNWARD into the heating hopper. Once attached, connect the airline and sensor cable. For calibration instructions, refer to [page 98](#)



Drop Tube Installation – ULTRA-600 Only

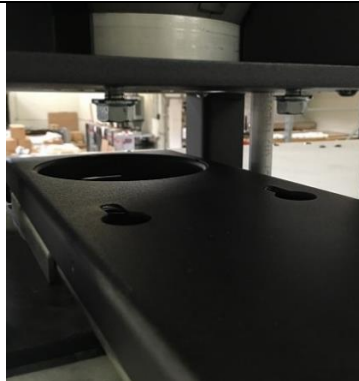
Insert the supplied **drop-tube** into the circular cut-out in the base of the heating hopper subframe, by feeding it in between the frame legs, as shown. It will sit flush with the base plate.

If the vacuum chamber fill valve is attached, it must first be removed by loosening the (2) 3/8"-16 x 1" flanged bolts and dropped through the keyhole. Refer to next step for clarification.



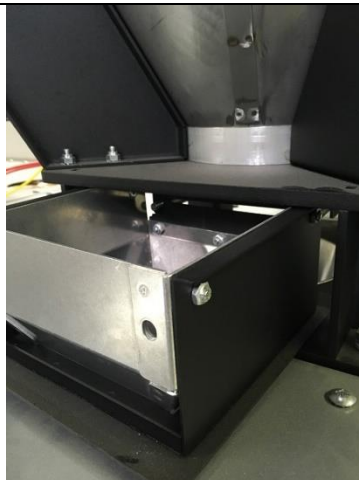
Install the **vacuum chamber fill valve** to the underside of the heating hopper using the supplied hardware (3/8"-16 x 1" flanged hex bolts). The air cylinder must be on the BACK SIDE of the machine.

The vacuum chamber fill valve utilizes key slots to allow for proper line-up and ease of installation.



With the drop tube and vacuum chamber fill valve securely in place, slide the **recollector** between the frame legs and install onto the threaded rods of the fill valve, located underneath the heating hopper.

Secure the recollector with the supplied wing nuts (or locknuts).



Attaching the Upper Vacuum Slide Gate

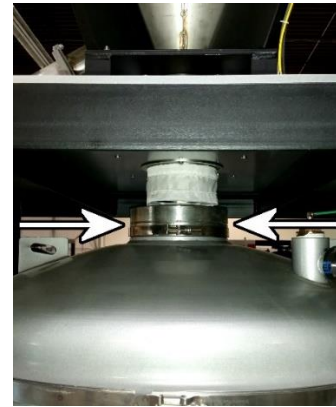
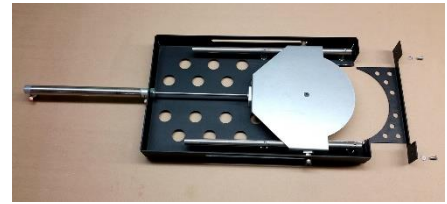
Note: If your Upper Vacuum Slide Gate is already installed from factory, skip this step.

If the ULTRA-600/1000 Upper Vacuum Gate was shipped detached from the dryer, it must be installed after the Heating Hopper is mounted and installed on the machine.

Items with this assembly:

- Upper Vacuum Gate
- Retainer Bracket
- two 1/4-20 1/2" button head screws

The Upper Vacuum Gate will install from the rear of the Dryer. Locate the slot on the mount ring at the very top of the Vacuum Tank. See photo at right.



With the Slide Gate facing up, slide the Upper Vacuum Gate assembly into the slot on the mount ring as shown in the photo to the right. Slide the Upper Vacuum Gate onto the mount ring until it fully seats into the slot. It may be helpful to slide the Upper Vacuum Gate left and right as it is installed.



Note: To fully seat the Vacuum Gate onto the mount ring, the tab in the inner arch of the Upper Vacuum Gate must go into the recessed hole of the mount ring on the Vacuum Chamber.



From the front side of the Dryer, install the Retaining Bracket onto the Upper Vacuum Gate and fully into the slot on the mount ring and secure it using the two 1/4-20 1/2" button head screws.



Install the two 5/32 (4mm) airlines onto the Upper Vacuum Gate air cylinder. The shorter line will connect to the air cylinder fitting closest to the slide gate.



Engaging the Load Cells

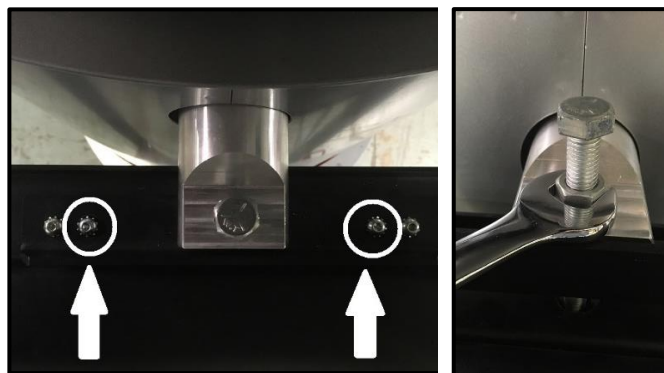


The load cells are immobilized prior to shipping and must be engaged for proper operation of the ULTRA Dryer. There are four load cells on the ULTRA-600; two for the vacuum chamber and two for the retention hopper; whereas the ULTRA-1000 has three load cells (one for vacuum chamber and two for retention hopper).

Vacuum Chamber Load Cells

The first step in engaging the vacuum chamber load cells is to remove the 2 retaining bolts that secure the vacuum chamber to the frame.

Next, the jam nut located on the loadcell transfer bolt needs to be loosened.



To engage the load cell, tighten down the load cell transfer bolt until there is roughly a ¼ inch (6mm) gap between the hanger bumper stops and the frame.

Tighten down the jam nut to secure the position and ensure proper load cell engagement.

Repeat steps for the other side (ULTRA-600).



Retention Hopper Load Cells

To engage the Retention Hopper load cell pair, remove the packaging straps from the Retention Hopper Lifting Lever. Lower the Retention hopper onto the load cell by pressing the lever back and down. This will engage the Retention Hopper lower frame onto the load cell pair.



When the Retention Hopper Lifting Lever is in its upright position, the lever's cams lift the weight off of the load cell pair and allow the Retention Hopper to be pulled out for servicing and cleaning purposes.



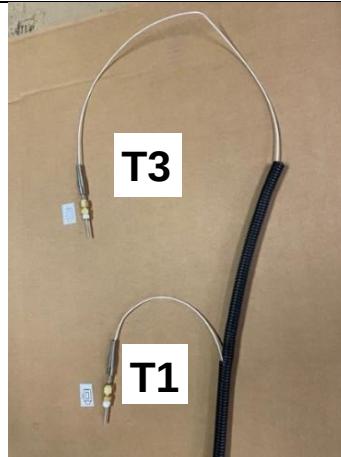
Installing the RTDs (Temperature Sensors)

Once, the heating hopper is properly mounted and secured onto the ULTRA machine, the RTDs and harness assembly can be connected.

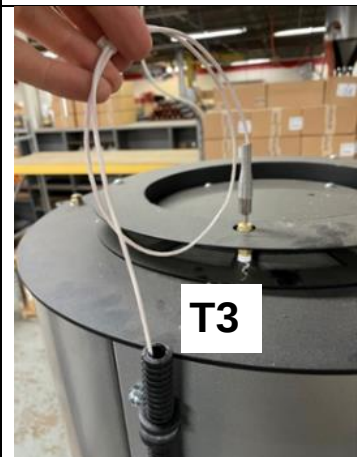
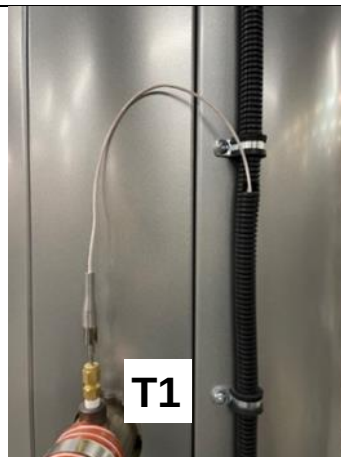
ULTRA-600

Attach the RTD harness assembly to the side of the heating hopper using a 5/32" Allen wrench. The RTD harness will have supplied p-clamps around the conduit along with 1/4-20 hardware, which will serve to anchor the harness in place.

The RTD cables are pre-wired into the machine at the I/O board



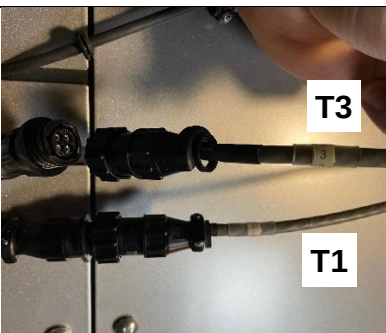
Using a 7/16" open end wrench, secure and tighten the new RTD's into the two locations on the heating hopper. Ensure that there is an adequate length of wire loop to prevent damage. Leave excessive wire length for the T3 RTD in the instance that a heating hopper extension is added in the future.



ULTRA-1000

The RTDs are pre-installed into the heating hopper of the ULTRA-1000. However, the cables need to be connected via CPC connectors at the top of the machine.

Connect the T1 cable to the connector next to the inlet label. Connect the T3 cable to the outlet label.



Compressed Air Connection

Connect an air supply to the air regulator's IN port using a male 1/2" NPT fitting.

An operating air pressure of 80 psi (5.5 bar) while the vacuum generator is running is required for proper operation of the Dryer.

If your air supply has oil in it, add an oil separator (coalescing filter).

Oil in the air will combine with dust drawn from the vacuum tank forming a paste inside the vacuum generator. It will stop working and require cleaning.

Observe the air pressure gauge to be sure the pressure maintains 80 psi (5.5 bar) while the vacuum generator is running as you check and adjust the regulator. If pressure drops below 80 psi, adjust the regulator. If the pressure cannot be maintained at 80 psi (5.5 bar) while the vacuum generator is running, then the air supply line is not adequate.



Air Pressure



Air pressure affects the ability to draw a high vacuum. We recommend a pressure setting of **80 PSI while the vacuum generator is running**. If it does not maintain pressure, the supply line is undersized.



IMPORTANT!

Do not supply Dryer with a lubricated air supply. Damage to Dryer may result. Use only a clean, dry, oil-free air supply.

Electrical Connection



RISK OF INJURY! Only qualified technicians should make electrical connections.

Connect Main Power

The electrical cable located on the left side of the Dryer on the power box supplies the power to the Dryer. Within the cable are four wires. Three of the wires are black and labeled with a number: 1, 2, and 3. The fourth wire is a green/yellow wire and is the ground wire.

Connect power to a properly fused disconnect.



ULTRA Branch Circuit Protection		
Protect the unit with fuses or circuit breakers at the amp ratings shown below:		
AMPS		
Voltage	ULTRA-600	ULTRA-1000
400 3Ø	60	100
480 3Ø	60	100
575 3Ø	60	100

User must take caution and care when connecting electrical supplies to the Maguire ULTRA dryer and ensure that all supply cables and/or interconnecting cables are correctly secured to the machines and/or are in a suitable cable tray, and/or conduit, as per the requirements of EN 60204-1, Clause 13.4.2.

Electrical checks (in accordance with EN 60204-1, Section 18) should be conducted on the equipment during the installation and commissioning phases.

Machine Overview: ULTRA-600/1000

RTD (Temperature Sensor) Locations

T1 – Heating Hopper Air Inlet

T1s – Heating Hopper Air Inlet Temperature **Setting**

T1a – Heating Hopper Air Inlet Temperature **Actual**

T2 – Dry Purge Air Temperature

T2s – Dry Purge Air Temperature **Setting**

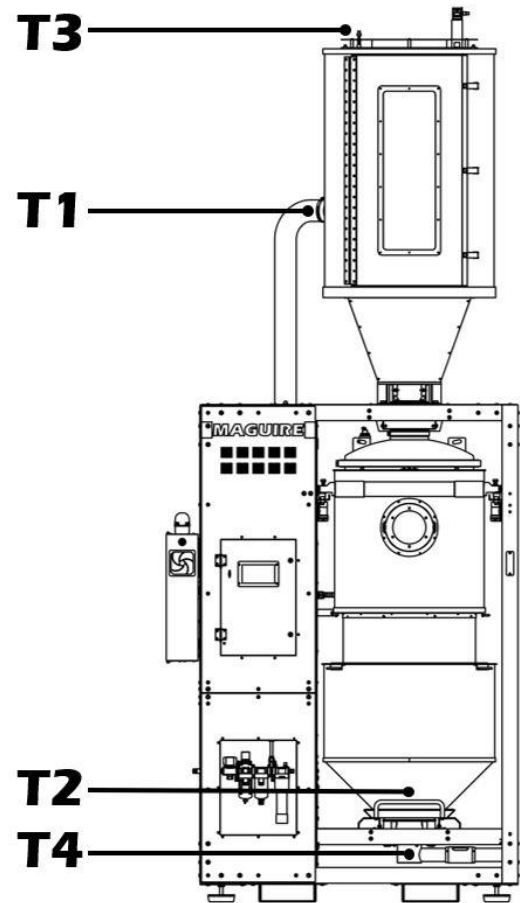
T2a – Dry Purge Air Temperature **Actual**

T3 – Heating Hopper Air Outlet Temperature

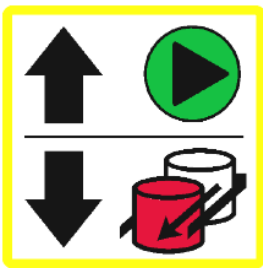
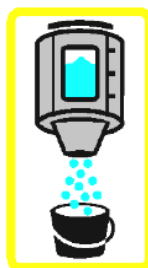
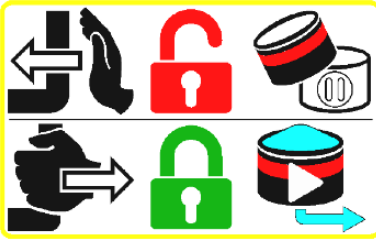
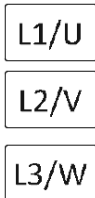
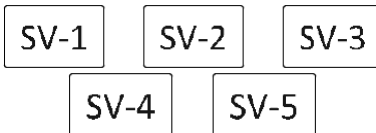
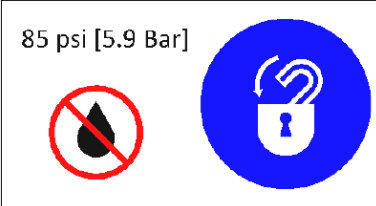
T3 – Heating Hopper Air Outlet Temperature

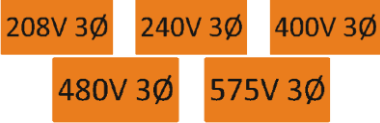
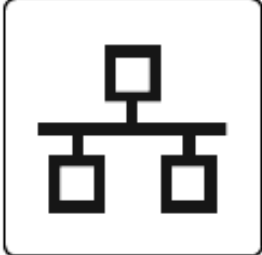
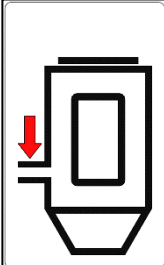
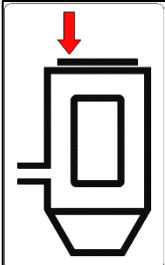
T4 – Material Outlet Temperature (optional)

T4 – Material Outlet Temperature



Machine Label Descriptions

Label Icon	Description	Label Icon	Description
	<u>Vacuum chamber lift switch</u> UP: Pneumatically lifts chamber up, continuing process DOWN: remove chamber; clean-out		<u>Heating Hopper Manual Drain Button</u> Pressing this button opens the necessary valves to perform a clean-out, emptying the heating hopper
	<u>Retention Hopper Drain Valve</u> IN: Unlocked, is now removeable, valve closed OUT: Locked, convey material, valve open		<u>CAUTION!</u> Hot surfaces
	<u>Incoming Main Phase Numbers</u> L1/U-Main Phase 1 L2/V-Main Phase 2 L3/W-Main Phase 3		<u>Solenoid Valve Numbering</u> SV-1: Valve #1 SV-2: Valve #2 SV-3: Valve #3 SV-4: Valve #4 SV-5: Valve #5
	<u>DISCLAIMER</u> Two people are recommended to lift, due to excessive weight		<u>DISCLAIMER</u> Do not use as a step. Doing so may results in damage to the ULTRA Dryer
	<u>Air Supply</u> Do not use a lubricated (oil) air supply. Equipped with a mechanical lock-out device		<u>DISCLAIMER</u> Read the owner's manual. Automatic start
	<u>CAUTION</u> Pinch Point. Keep fingers away to prevent injury.		<u>Primary Earth (Ground)</u>

	<u>Main Voltage</u> 208V, 3-phase 240V, 3-phase 400V, 3-phase 480V, 3-phase 575V, 3-phase	<u>208V 3Ø</u> 	<u>Power Cabinet Safety Warnings</u> 208V, 3 Phase Electrocution hazard Arc flash hazard Electrical LOTO
<u>240V 3Ø</u> 	<u>Power Cabinet Safety Warnings</u> 240V, 3 Phase Electrocution hazard Arc flash hazard Electrical LOTO	<u>400V 3Ø</u> 	<u>Power Cabinet Safety Warnings</u> 400V, 3 Phase Electrocution hazard Arc flash hazard Electrical LOTO
<u>480V 3Ø</u> 	<u>Power Cabinet Safety Warnings</u> 480V, 3 Phase Electrocution hazard Arc flash hazard Electrical LOTO	<u>575V 3Ø</u> 	<u>Power Cabinet Safety Warnings</u> 575V, 3 Phase Electrocution hazard Arc flash hazard Electrical LOTO
	<u>CAUTION</u> If equipped if (optional) 3-phase monitoring relay, LED indicator will illuminate if rotation is backwards.		<u>Ethernet Port</u>
	<u>FlexBus Lite Port</u>		<u>Remote Mounted Controller Port</u>
	<u>RTD Location</u> <u>T1 - Inlet</u>		<u>RTD Location</u> <u>T3 - Outlet</u>

Home Screen Overview



T1 Actual - Actual Heating Hopper inlet air temperature

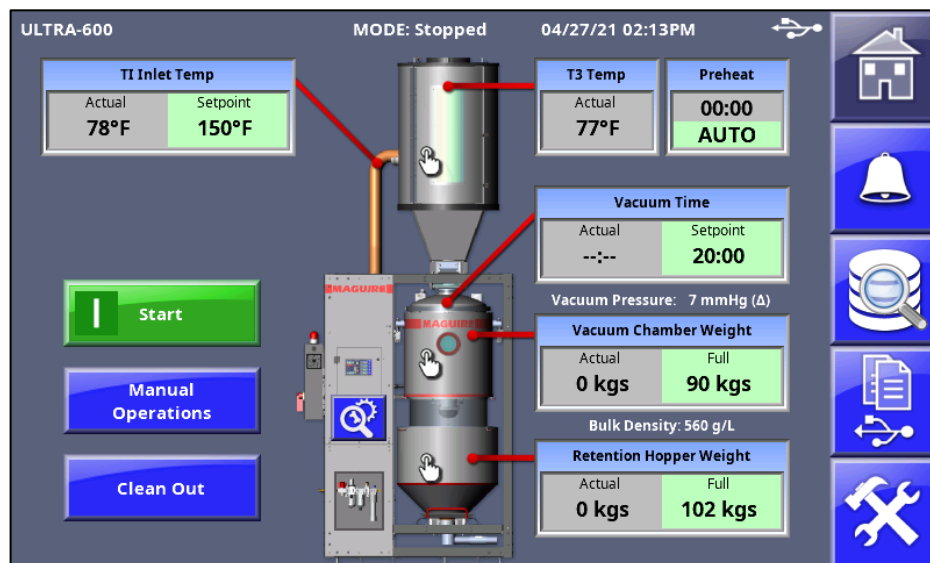
T1 Setpoint - Heating Hopper inlet air temperature Setpoint. Touch to adjust.

T3 Temp – Actual Heating Hopper temperature

Vacuum Time – Vacuum Time Actual and Vacuum Time Setpoint. Touch to adjust.

Vacuum Chamber Weight
Vacuum Chamber Actual and Maximum Weight

Retention Hopper Weight
Actual and max. weight



Preheat – Preheat Time Actual and Preheat Time Setpoint. Touch to adjust.

Info - Access to advance information.

Heating Hopper Setup, Vacuum Chamber Setup, and Retention Hopper Setup screens are accessed by pressing the heating hopper, vacuum chamber, or retention hopper icons on the home screen (mouse-over icons).

Title Bar - Located across the top of the screen, the title bar displays Model, ID, I/O status, current operating mode, date and time, and Ethernet / USB status.

Navigation Menu - Located along the right side of the screen, these buttons allow quick navigation to frequently used and top-level screens. The middle buttons can be rearranged if needed.

Start / Shutdown Button - Main Start/Stop Control Button.

Navigation Menu

	Home Screen	Pressing the Home Screen button from any other screen will return the operator to the Home Screen.
	Alarm and Event	Displays a history of alarms and other events with a date and time stamp and description.
	Presets	Material presets (recipes) that enable users to input, edit, and load material parameters to minimize testing setup time.
	Print Center	Print related options including Totals, Parameters, Alarm History, Events, Cycle History, Diagnostics. See page 75.
	Setup Login	Password protected access to advanced Dryer and System configuration information. See Page 42.

Modes of Operation

Run Dryer – Initiates preheat cycle for material processing. See page 29

Run Dryer in Batch Mode – See page 48

Manual Operations - Allows the user to have direct control of specific machine outputs See page 41.

Clean Out – Allows for individual chambers to be easily cleaned. See page 91

Operating the ULTRA Dryer

Startup Instructions

Ambient Operating Conditions

Temperature Range: 41°F – 122°F (5°C – 50°C)

Maximum Allowable Humidity: 80% @ 122°F (50°C)

Maximum Altitude: 8200 ft. (2500m)

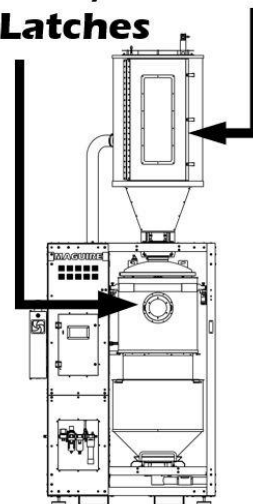
This section explains how the dryer operates from a cold start. There are three concurrent operations. Heating, Vacuum and, Retention. Cold startup begins with Preheat. Preheat only occurs before the first cycle of the dryer's initial startup, otherwise each cycle begins with material heating. The vacuum operation pulls and holds a vacuum on the material for at least the Vacuum Time setpoint (or longer if material is at or above the retention hopper low level parameter RHL before the vacuum time reaches setpoint). The Retention operation holds the dried material in the Retention Hopper. If equipped with the optional membrane air dryer, the material will be blanketed with hot dry air until it is conveyed away.

Important: Inspect the ULTRA, verify that machine is clear of all material from heating hopper, Vacuum Chamber and Retention Hopper. To facilitate a Clean Out, use the Clean Out function accessible from the home screen.

Startup and Operation Instructions

- 1. ENSURE HATCH IS CLOSED.** Ensure that all the latches are properly closed on both the heating hopper door and vacuum chamber access hatch. Also, make sure that the removable retention hopper is in place and that the load cells are properly engaged.
- 2. Load material into the Upper Heating Hopper.** Wait for the Heating Hopper to fill with material before starting the Dryer.
- 3. Turn on Main Power** by rotating the 60-amp Main Disconnect Handle to the Red ON position. This powers up the ULTRA-600/1000 Dryer. On initial power up of the ULTRA, the Control Panel powers ON automatically.

Door/Window Latches



Important Settings

4. Operating the Controller (Home Screen):

Bulk Density – Bulk density is the weight per unit volume of the raw plastic material as it is received from the material manufacturer. This parameter is important to set to ensure proper performance of the ULTRA-600. Bulk density can be edited under 'Advanced Info'.

*****WARNING:** Without setting this parameter the machine may not maximize its material throughput and/or have a chance to overflow.

NOTE: If the **bulk density** of the material is not published and is **unknown**, refer to [page 32](#)

T1 Inlet Temp Setpoint – This is heating hopper inlet temperature. By the end of the *preheat* cycle time, all material in the Heating Hopper will be heated to this temperature. By default, the Setpoint temperature is set to 150°F. Contact the material manufacturer for temperature recommendations.

Some materials tend to mechanically lock themselves into the base of the heating hopper after rapidly thermally expanding. In this case, temperature ramping may be necessary.

[HOME](#) > [Heating Hopper Setup](#) > [Temp. Ramping](#)

Off [def.]: No temperature ramping occurs.

Preheat: During preheat cycle only, the T1 inlet temperature is incrementally increased to setpoint temp. via a series of steps defines by the RMP parameter (see [page 63](#)).

On: Ramping occurs on every heat cycle, including preheat.

Preheat Time – This is the duration of heating from a cold start.

Vacuum Time – This is the duration of a vacuum and is what determines the cycle time. The default vacuum time is 20 minutes. In most drying operations, this time is adequate and does not need to be adjusted. Special circumstances may require different vacuum times.

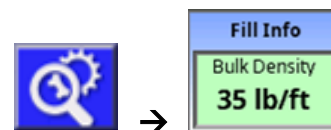
Press the setpoint field to adjust the setting. Use the on-screen keypad to enter the setpoint and press the green check to complete the adjustment

Material Outflow Valve – Ensure that this valve on the bottom of the retention hopper is **OPEN**. This will allow the processed material to leave the machine. *Failure to OPEN this valve will halt the drying process.*

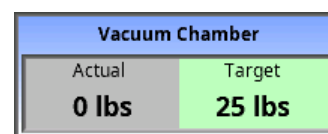
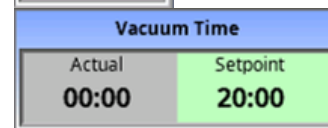
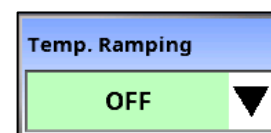
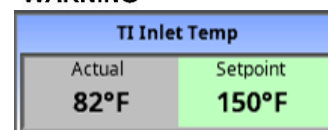
To check the state of the valve, press the retention hopper icon on the home screen. The button displays the current state. Press the CLOSED button so it reads OPENED. The valve will now remain open.

Vacuum Chamber Target Fill Weight – This is the amount of material that will be dispensed into the vacuum chamber from the heating hopper. Pressing this will prompt the user to select from five entry modes. See next page for additional information.

Press the **START** button to start the dryer

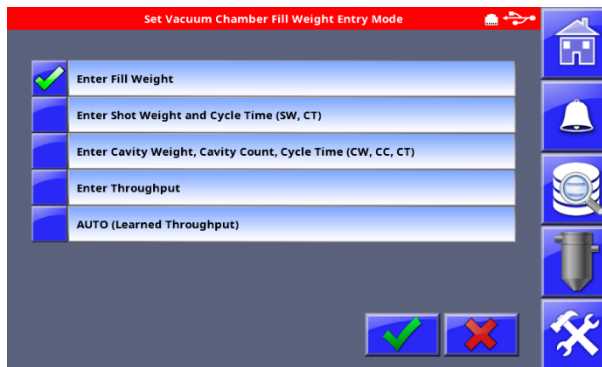


WARNING

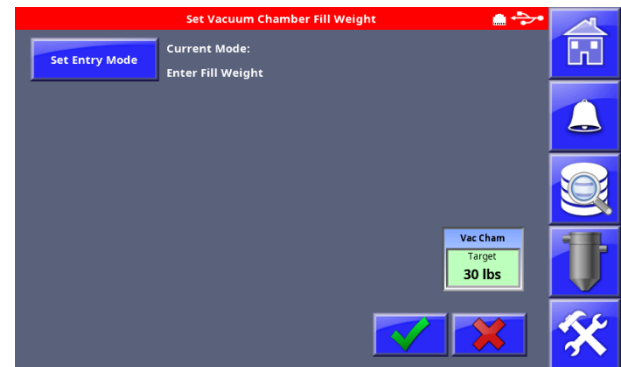


Entry Modes – Setting Vacuum Chamber Fill Weight

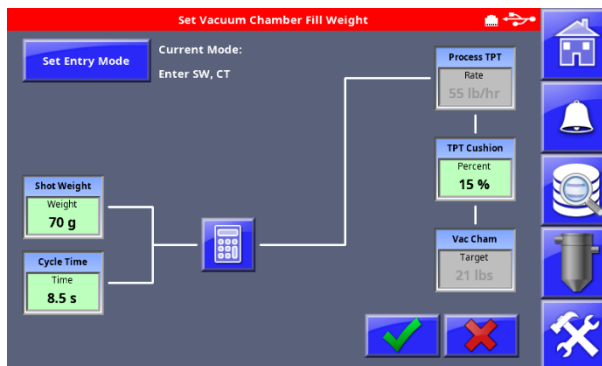
From the home screen, the desired fill weight entry mode can be selected by tapping 'Target' within the 'Vacuum Chamber' field. Within this screen, there are five modes of entry that can be selected as shown below.



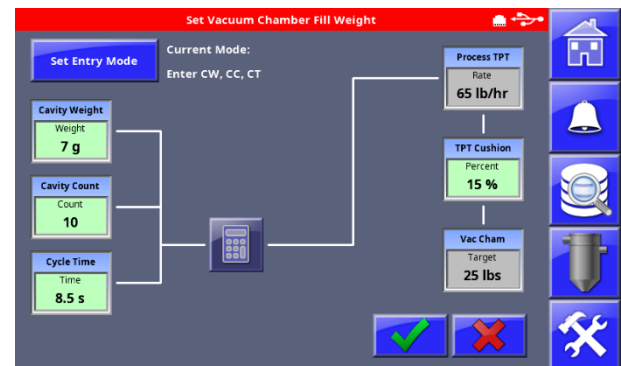
Entry Mode Screen – Select and press ✓



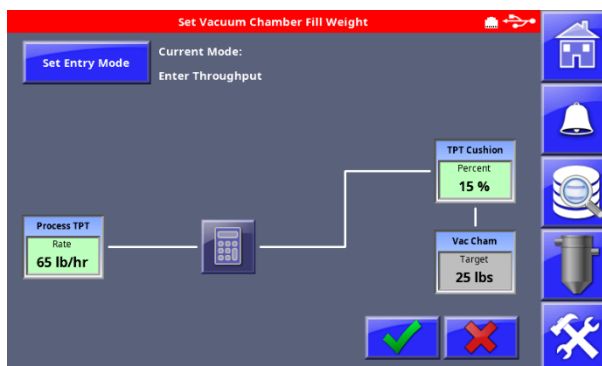
Enter Fill Weight [DEFAULT] – set target weight of the vacuum chamber.



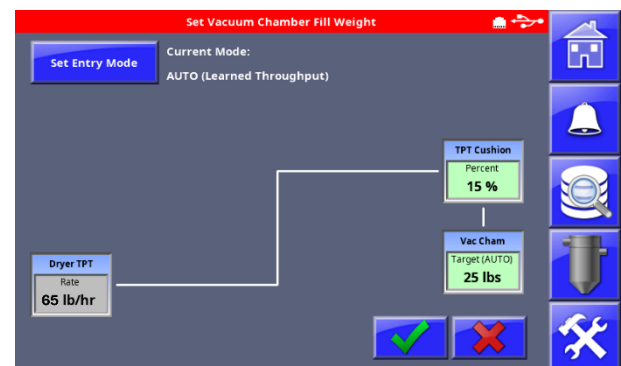
Enter Shot Weight and Cycle Time (SW, CT)* – Input shot weight and cycle time to calculate the throughput rate and vacuum chamber target weight. Default throughput cushion is 15%.



Enter Cavity Weight, Cavity Count, Cycle Time (CW, CC, CT)* – Input cavity weight, count, and time to calculate the throughput rate and vacuum chamber target weight. Default throughput cushion is 15%.



Enter Throughput* – Input the process throughput rate to calculate the vacuum chamber target weight, using the default throughput cushion of 15%.



AUTO (Learned Throughput) – Learned dryer throughput is used to calculate the vacuum chamber fill weight. The default throughput cushion is 15%.

*For calculation to take place, press the  button if relevant.

What is Happening When the ULTRA Dryer is Operating?

During the Pre-heat operation material in the heating hopper is brought up to temperature (T1s). Preheat time is determined by the specified Preheat Time on the Pre-Start screen (timed preheat, default 35 minutes) or by the Preheat Setup Auto option, which sets an inlet to outlet temperature delta and a minimum preheat time.

After pre-heat, approximately one third of the material in the heating hopper is dispensed into the vacuum chamber, and the first vacuum cycle begins. Each vacuum cycle has a minimum vacuum time, set on the Pre-start screen, or the main run screen (VTs). (default is 20 minutes).

The loader loads the Heating Hopper with new material as the Vacuum Chamber receives the heated material and heating cycle begins concurrent to vacuum cycle (the first vacuum cycle is timed). The new batch of material in the upper portion of the heating hopper will take less time to heat. Minimum time in the heating is dictated vacuum time.

After first vacuum cycle, material is then dispensed into retention hopper ready for use. Material in the retention hopper is blanketed with dry air (if equipped with optional membrane air dryer).

The rate of consumption of dried material from the retention hopper ultimately dictates the amount of time that the material will be preheated and under vacuum. **Examples:** If it takes 25 minutes to deplete the retention hopper, the vacuum cycle will run past its 20-minute setpoint (pre-start screen) to 25 minutes. This is normal operation. However, if the retention hopper is depleted in 15 minutes and the vacuum time is set to 20 minutes, there will be a 5-minute window where no material is available. This indicates that the throughput of the dryer has been exceeded. If the Throughput Alarm is enabled (Alarm Setup), a Throughput Alarm (Alarm Code 20) will be triggered.

Unknown Material Bulk Density? Try this...

Some materials do not have published specifications, such as bulk density, and it is important that an approximated value be determined. Bulk density is the weight of the “freely settled” raw pelletized material per cubic foot (liter). The ULTRA will perform more efficiently, and throughput will be maximized, if this parameter is properly set prior to operation. Follow the steps below.

1. Using a standard “5 gallon” bucket (or any **container of known volume**), which holds 5.5 gallons or 0.74 cubic feet (imperial: 20.8L) when filled to the brim, place on scale and zero/tare.
2. Fill the bucket to the brim (top of bucket) with raw pelletized material, using a flat object to remove any excess material that exceeds the height of the brim.
3. Place back on scale (which should read a negative weight) and record the measured mass of the pelletized material.
4. Divide the mass (lb. or g.) by the volume (ft³ or L) to yield the material’s bulk density.



Theory of Operation / Performance

Theory of Vacuum Drying

Vacuum Drying requires two sequential steps: heat and vacuum. The effects of both are explained below:

Heat: Heating the pellets does two things:

1. It breaks the molecular bond between the water molecules and the polymer molecules.
2. It excites the water molecules, causing them to ultimately migrate to the surface of the pellet where they can escape into the surrounding vacuum atmosphere.

Vacuum: Applying a vacuum to the pellets (i.e., lowering the absolute pressure of their surrounding atmosphere) does three things:

1. It lowers the boiling point of water, causing any surface moisture to flash off.
2. It creates a vapor pressure differential which drives water trapped internally to the surface via capillaries.
3. It creates an extremely dry surrounding atmosphere via rarefaction. The relatively high concentration of water molecules inside the pellet then naturally migrates to the area of lower concentration to establish equilibrium.

Measuring Performance

The true measure of a dryer's performance is determined by the moisture content of the resin after the dryer has completed its process. Resin moisture content, however, is not easily measured, so dryer manufacturers use other criteria to measure performance.

Conventional desiccant dryers use dew point as a measure of performance. This is a measure of the dryness of air passing over the resin, but not the dryness of the resin itself.

For example, for a particular resin, 180°F (82°C) degree air dried to a -40°F (-40°C) dew point and passed over the material for 4 hours is sufficient to reduce the moisture content to the required level of dryness based on industry experience.

Since the ULTRA dryer does not use dry air, dew point values do not come into play. Rather, setpoint temperature, heat residence time, vacuum residence time, and vacuum level are used as drying metrics. For example, testing has shown that heating ABS to a temperature of 180°F (82°C) and subjecting it to a vacuum level of 80 mm Hg (absolute) will typically result in an acceptable final moisture content.

It is important to note that in vacuum drying, just as in any other type of drying, many variables come into play. Ambient conditions, starting moisture content, the stringency of the desired final moisture content, material quality, and material condition are all part of the equation.

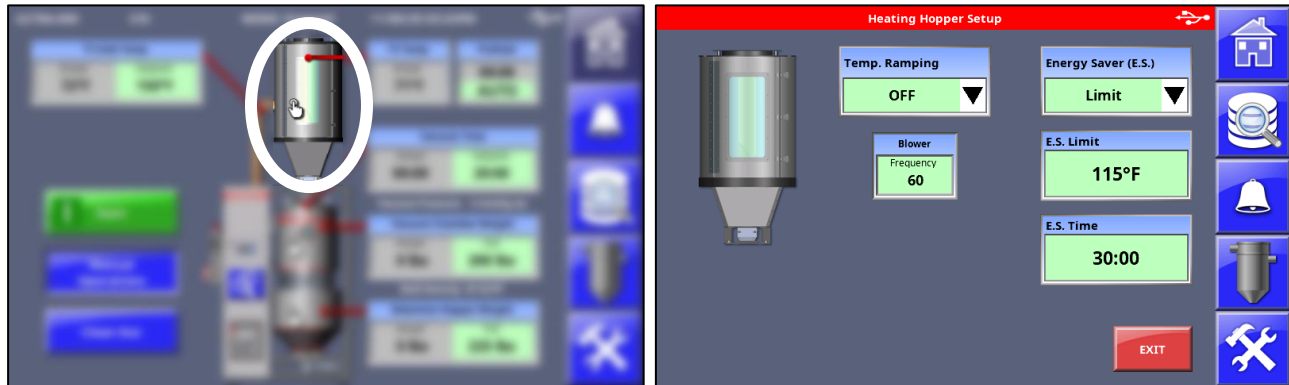
For this reason, some amount of experimentation and/or consultation with Maguire may be necessary to attain desired results.

Energy Saver Modes

Maguire ULTRA Low Energy Dryers are proven to dry plastic materials 6x faster than conventional dryers and use up to 85% less energy. This is due in part to the utilization of various Energy Saver Modes that the user can enable.

Energy saver modes, limit temperature, and time can be managed from the Heating Hopper Setup Menu.

Home Screen > Heating Hopper Setup > Energy Saver (E.S.) > Limit / Dynamic



LIM (limit) mode [default]:

Preheat is unaffected. All post-preheat cycles: When the temperature of the air exiting the heating hopper (T3) reaches ESL (default = 125°F / 52°C), the heater and blower shut down. They remain in a dormant state until one of two things happen: the unit cycles, or EST minutes (default = 30) elapse. If EST minutes elapse, the blower and heater resume normal operation, bringing the material in the heating hopper back up to temperature, then shut down again. This could continue indefinitely. This logic is blocked for the first 5 minutes of a cycle to prevent residual heat from a previous cycle from triggering a premature Energy Saver heater/blower shutdown.

DYN (dynamic) mode:

Preheat is unaffected. The first post-preheat cycle is run as a LIM cycle. The amount of heater/blower dormant time at the end of said LIM cycle is then proportioned over the beginning and the end of the subsequent cycle as per the ESP parameter (default = 02060) setting. Example:

During the first post-preheat cycle, which ends up being 35 minutes long, the heater and blower shut off at VTA=15 minutes, equating to 20 minutes of blower/heater dormant time.

At the beginning of the next cycle, the blower and heater will remain OFF for $(.60 \times 20) = 12$ minutes.

In theory, the blower and heater will be shut down for the 8 remaining minutes (of the 20 minutes) at the end of the cycle (triggered by the ESL parameter as in LIM mode) if the throughput demand does not change.

The "02" in the ESP parameter (default) is the minimum amount of beginning-of-cycle heater/blower OFF time regardless of the previous cycle, so long as the previous cycle terminated via LIM.

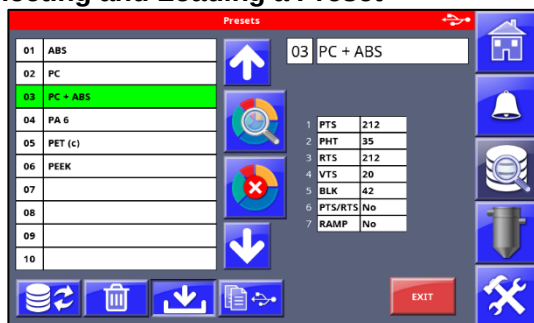
The intention of the DYN mode is to allow a 3rd party loader to fill the heating hopper before heating starts.

Presets: Feature

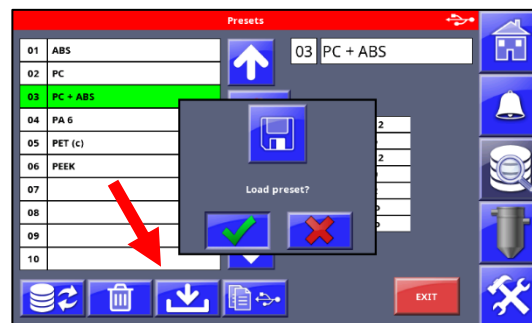


The ULTRA controller has a built-in 'Presets' feature where users can import/export material presets. This can be found on the default navigation bar. Within the interactive screen, users can input, edit, and load material parameters which minimize material processing setup time. The four main capabilities of the Presets feature are explained below.

1. Selecting and Loading a Preset

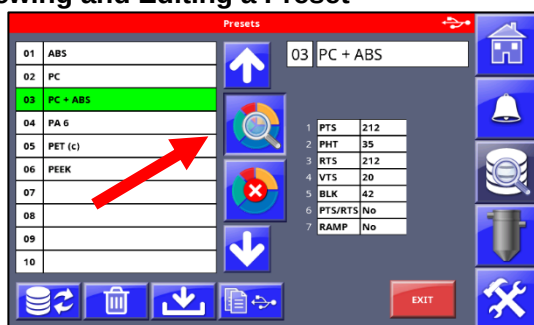


Select the preset by clicking and highlighting it

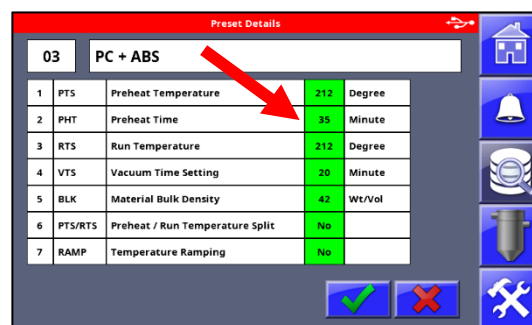


Pressing the 'Load Preset' button will load the material preset and its associated parameters.

2. Viewing and Editing a Preset

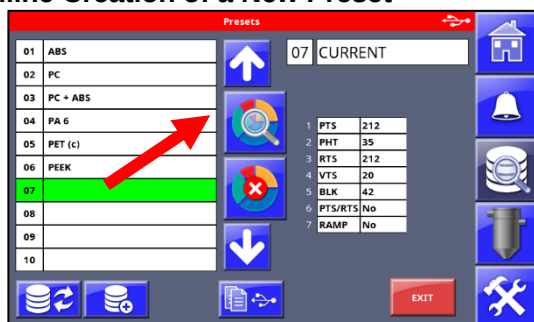


Highlight the material preset from the list and select the 'Preset Details' button to view its parameter settings.

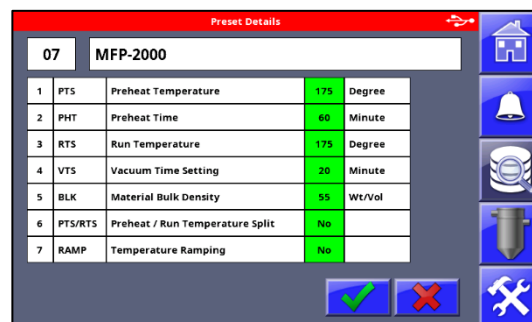


The preset name (i.e., PC + ABS) and setpoint values can be edited here by clicking inside the field and modifying.

3. Online Creation of a New Preset



Highlighting a blank row and selecting the 'Preset Details' button allows for a user to input a new material preset.



In the 'Preset Details' screen, the user can assign a name and input new setpoint values. Current parameter settings are used to pre-populate the new preset profile.

Presets: Feature – Cont.

4. Offline Editing / Adding New presets



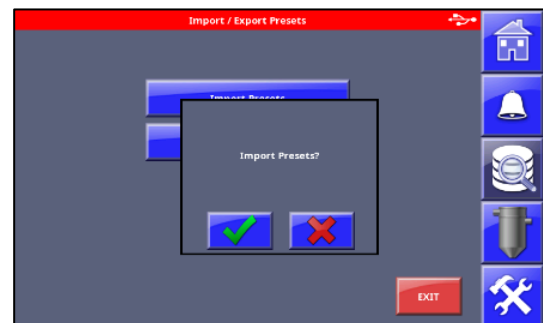
Press the 'Copy to USB' in the 'Presets Menu'



Exports presets to USB in Excel Format (.CSV)

	A	B	C	D
1	Preset_Name	Active	PTS	PHT
2	ABS	0	180	35
3	PC	0	230	35
4	PC + ABS	0	212	35
5	PA 6	0	180	45
6	PET (c)	0	350	45
7	PEEK	0	302	45
8	CUSTOM	0	275	60

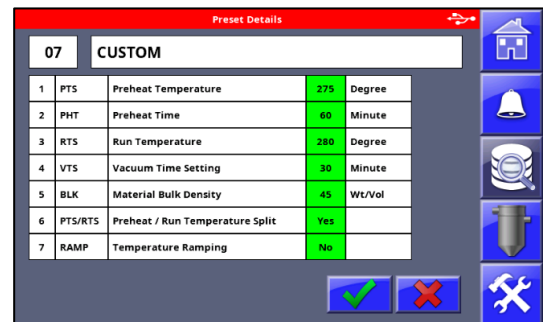
Input desired material with parameters in a new row.



Plug in USB with new material preset added to .CSV file and press the 'Import Presets' button.



The new material preset now shows up in the list of available presets



The parameter values in the 'Preset Details' screen will mimic what was inputted into the .CSV file.

Shutdown Options

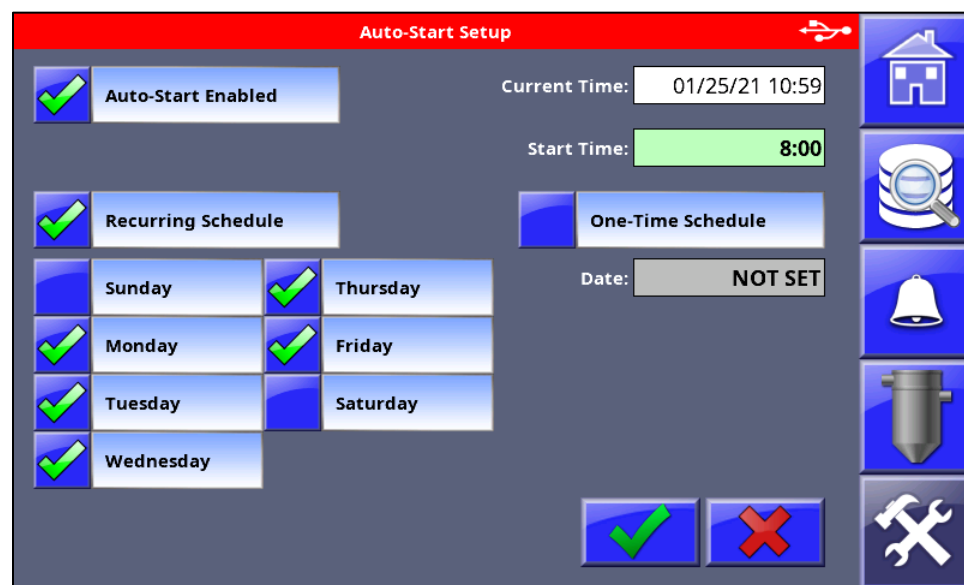
Shutdown Options are only present after a 'Start' has been initiated.

End Preheat - (shown only if in a preheat cycle) Skips the preheat allowing material to immediately pass down to the Vacuum Chamber (example: material has already been heated and dryer has been taking offline briefly and powered back on). At any point after the preheat cycle has ended (or forced to end), pressing the red Shutdown button will bring up the Shutdown Options screen with the following shutdown options:	
Shutdown – Pressing the red 'Shutdown' button (after preheat has ended) will prompt a series of shutdown options Smart Stop – With the 'Smart Stop' feature, the machine will not add more material into the machine and completely dry the remainder of the material in the machine. At the end of the 'Smart Stop,' there will be no material in the ULTRA which is essential for quick cleanup. Immediate Shutdown – This causes an instantaneous, yet controlled, complete shutdown of all systems within the ULTRA (heater, blower, vacuum and purge system). Cooldown & Shutdown [special feature] – When this feature is selected, the ULTRA will gradually cool down the material in the heating hopper to a desired temperature over a specific designated time period. Cancel - Exits the shutdown option screen Auto Stop (must first be enabled) – Initiates a shutdown at specified date and time. For further explanation on how to set the Auto Stop date and time see page 39.	    

Auto-Start Setup

Auto-Start initiates a start-up at a specified time on specific days of the week. To enable and configure Auto-Start follow the steps below.

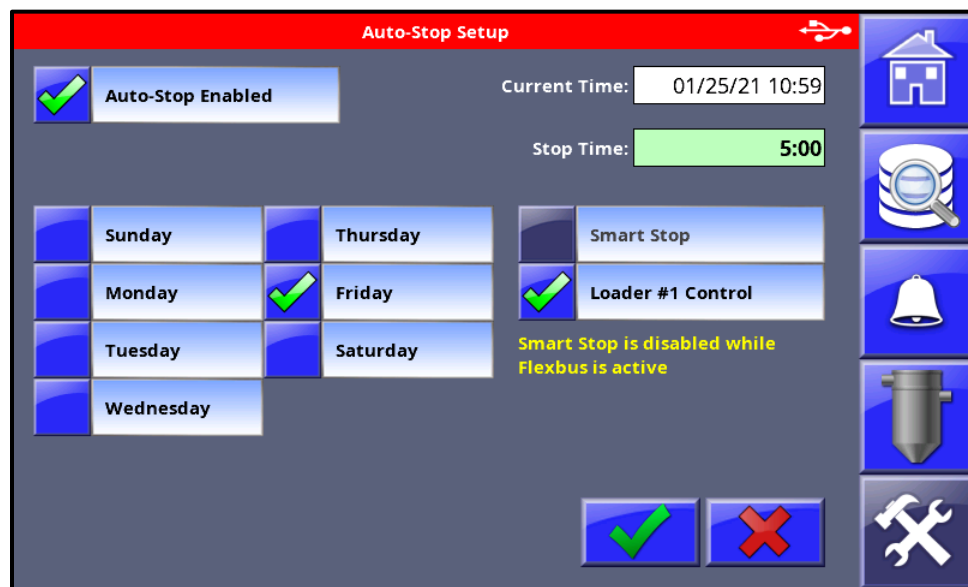
Press		Display will prompt for a password. (default: 2222)	Then press:	
Press	Dryer Configuration	Display will show the Dryer Configuration categories.		
Press	Auto-Start Setup	Display will show the Auto-Start screen.		
To Enable Auto-Start:				
Press		Auto-Start Enabled	to enable Auto-Start. Display will show Auto-Start scheduling.	
Press	Recurring Schedule	or	One-Time Schedule	Set the time of day Auto-Start should occur.
Press		to select the days of the week Auto-Start should occur.		
Press		to save the Auto-Start settings.		
Press		the Home Button to return to the Home Screen.		



Auto-Stop Setup

Auto-Stop initiates a shutdown at a specified time on specific days of the week.
To enable and configure Auto-Stop follow the steps below.

Press		Display will prompt for a password. (default: 2222)	Then press:	
Press	Dryer Configuration	Display will show the Dryer Configuration categories.		
Press	Auto-Stop Setup	Display will show the Auto-Stop screen.		
To Enable Auto-Stop:				
Press		Auto-Stop Enabled	to enable Auto-Stop. Display will show Auto-Stop scheduling.	
Press	Schedule	Set the time of day Auto-Stop should occur.		
Press		to select the days of the week Auto-Stop should occur.		
Press		to save the Auto-Stop settings.		
Press		the Home Button to return to the Home Screen.		



Advanced Information



On the Home Screen, pressing this will display additional information such as readings of all RTD thermometers, vacuum time elapsed, absolute pressure in the vacuum chamber, blower drive frequency, etc.

Note: By default, some of these readings will not be shown in the 'Advanced Information' screens, unless they are enabled in the 'Display Options' menu.

T1 Actual: Actual heating hopper inlet air temperature.

T1 Setpoint: Heating hopper inlet air temperature Setpoint.

Heat Hopper: Heating Percent (%) output.

T3 Temp: Actual heating hopper temperature

Heat Hopper: Heating hopper level sensor reading (%)

T4 Actual: Material outlet temperature

Fill Info Max: The desired weight of material to be dispensed into the Vacuum Chamber.

Material Bulk Density: Bulk density of material in either pounds per cubic foot or kilograms per liter.

Cycle Count: Total number of cycles since start button was pressed.

Cycle Time: Total time to process a completed batch of dry material.

Valve Timings – Fill: Total time to fill the Vacuum Chamber.

Valve Timings – Dump: Total time to dump the Vacuum Chamber.

Batch Mode Totals – Portion: Current batch weight reading

Batch Mode Totals – Target: Set target batch weight.

Next Purge: Time until next purge cycle

Valve Rates – Fill (VFR): Vacuum chamber fill rate (gram/second)

Valve Rates – Dump (VDR): Vacuum chamber dump rate (gram/second)

Load Cell Readings – Vacuum: Weight in vacuum chamber

Load Cell Readings – Retention: Weight in retention hopper

Totalizer Weight: Calculated total of all cycles since last clear of totals.

Thruput Rate: Calculated throughput, weight per hour.

Residence Time: Actual Vacuum Time.

Energy Usage: Displays values in wattage, W/lb (W/kg.) Cur., and W/lb. (W/kg.) Avg.

Data View: Table showing additional information.

Manual Operations

This menu gives the user direct control of specific machine outputs.

Operate Outputs – Manually toggle essential machine capabilities.

Alarm Audio – OFF/ON – Operates audible alarm.

Alarm Strobe – OFF/ON – Operates strobe.

Vac Cham Fill – CLOSED/OPEN - Gate located at the base of the heating hopper.

Vac Gate Upper – CLOSED/OPEN – Material gate above vacuum chamber.

Vac Cham Dump – CLOSED/OPEN – Internal gate (not visible) at the base of vac chamber.

Vac Gate Lower – CLOSED/OPEN – visible disk-shaped gate below vacuum chamber.

Vac Gen Supply – CLOSED/OPEN – Vacuum generator supply. When operating, the vacuum generator supply pulls a vacuum on the vacuum chamber.

Vac Gen Check – CLOSED/OPEN – Vacuum generator check valve located on the vacuum generator. Holds the vacuum on the vacuum chamber.

Vac Cham Purge – CLOSED/OPEN – Located below the vacuum generator. When open the vacuum on the vacuum chamber is released.

Purge Supp. – CLOSED/OPEN – This valve allows the purge heater to heat the dry air that enters the retention hopper.

Mat Outflow V. – CLOSED/OPEN – Located below the retention hopper. This valve controls the material leaving the retention hopper.

Loader 1 – In 'Relays' Mode, this tests functionality of Loader 1

Loader 2 – In 'Relays' Mode, this tests functionality of Loader 2

Running Contact – testing the functionality of the drying running contact. Refer to [page 47](#)

Blower Test – Operates the blower.

Blower – OFF/ON toggle the blower on and off.

Auxiliary – CLOSED/OPEN: Input status

Heater Contactor – CLOSED/OPEN: Input status

Frequency – Set Blower Frequency

Speed Reference – Input Status of blower speed reference

T1a – Heating Hopper inlet temp actual.

T3a – Heating Hopper exhaust temperature actual

Wattage – Actual Blower wattage

Heater Test – Operates heater and blower that supplies heat to the Heating Hopper.

T1a – Heating Hopper inlet temp actual.

T1s – Heating Hopper inlet temp setpoint. Run temperate can be set here.

Heat Hopper Output – Heater duty cycle displayed as a percentage of max capacity.

T2a – Heating Hopper exhaust temperature actual

Start – Starts the heater test. Blower will run during test.

Blower Status – ON/OFF: Input status of blower

Wattage – With 'Energy Usage' enabled, heater wattage is displayed in watts.

Blower Frequency – Blower Frequency expressed in Hz.

Test Mode – Auto or Manual. In Auto, controller will modulate the heater based on a temperature setpoint. In manual mode, the heating hopper output percentage is the driver.

****ULTRA-600/1000 have the ability to test the Purge Heater as well*

Vacuum Test - Tests the Vacuum System

Start – Starts the vacuum test. Runs the vacuum generator system.

Mode: Manual Mode – Vacuum test cycles continue until manually halted.

Mode: Cycle Mode – Vacuum test cycles are driven by the Vacuum Time Setpoint (minutes)

Purge Cham: OFF/ON/CYCLE – Behavior of Purge Chamber during Vacuum Test

Test Timers: Evac Time – Amount of time to attain the vacuum setpt during the current test.

Test Timers: Cycle Time – Amount of time in between vacuum generator runs during a vacuum hold. Used to determine vacuum chamber seal integrity.

Settings: Pdel – The pressure difference above VPL at which the vac generator turns back on. See VPD

Settings: Pset – Absolute pressure that the Vacuum Chamber will be evacuated to. See VPL parameter.

Next Purge – Countdown timer until vacuum chamber's next purge cycle

Pressure: Actual (Δ) – Displays the amount of vacuum within the vacuum chamber in mmHg[def.]

Vacuum Chamber Fill Test – Test material flow rates and diagnose fill/valve problems with the vacuum chamber.

Timed Dispense – Opens necessary valves for a designated amount of time in milliseconds.

Weighed Dispense – Keeps necessary valves open until designated dispense weight has been achieved.

Start – Initiates the dispense test. Results can be printed to a USB drive.

Retention Hopper Fill Test – Test material flow rates and diagnose fill/valve problems with the retention hopper.

Timed Dispense – Opens necessary valves for a designated amount of time in milliseconds.

Weighed Dispense – Keeps necessary valves open until designated dispense weight has been achieved.

Start – Initiates the dispense test. Results can be printed to a USB drive.

Purge Heater Test – Test the functionality of the heater and purge supply valve that delivers heat to the air entering the retention hopper.

T2 Inlet Temp – This box shows the current Actual temp and allows the user to change the Setpoint temperature.

Auto/Manual - In Auto, controller will modulate the heater based on a temperature setpoint. In manual mode, the purge output percentage is the driver.

Start – Starts the purge heater test. Temperature will increase until setpoint is reached.

Over Temp. Failsafe – CLOSED/OPEN. The status is driven by a thermal switch which OPENS when sensing an over-temperature condition.

Setup Menu Explanation



The setup menu is a password protected area for accessing Dryer or System specific configuration settings and is accessible from the main screen's navigation panel. This screen is also home to firmware information such as: TSC Version, TSC bootloader, I/O Version, I/O Bootloader, and MAC Address. The Setup menu and its nesting is laid out below.

➤ <u>Dryer Configuration</u> ➤ Alarm Setup ➤ Material Shortage Alarm ➤ Material Ready Alarm ➤ Misc. alarm options ➤ Auto-Start Setup ➤ Enable Auto-Start ➤ Recurring Schedule ➤ One-Time Schedule ➤ Auto-Stop Setup ➤ Enable Auto-Stop ➤ Smart Stop ➤ Loader #1 Control ➤ Convey Setup ➤ Convey Via... ➤ Loader #1 Mode ➤ Loader #2 Mode ➤ Totalizer ➤ HH High Level ➤ Purge Setup ➤ Purge Chamber ➤ Purge Interval ➤ Purge % ➤ Load Cell Setup ➤ Zero / Full Weight Calib. ➤ Flow Rate Calibration ➤ Preheat Setup ➤ Preheat Mode ➤ Preheat Setpoint ➤ Preheat Delta Temp. ➤ Preheat Time ➤ Preheat and Run Temp. ➤ Parameters ➤ Blower ➤ Dispensing ➤ Heater ➤ Load Cell ➤ System ➤ Vacuum ➤ Special Features ➤ Batch Mode ➤ Auto Fill Adjust ➤ Cycle Pause ➤ Valve Clean Pause ➤ Cooldown Mode ➤ Running Contact ➤ HH Level Sensor	➤ <u>System Configuration</u> ➤ Data Logging ➤ Logging Interval (sec.) ➤ Log Events to: ➤ Preferences ➤ Change Passwords ➤ Date and Time ➤ Display Units ➤ Language ➤ Navigation Bar Options ➤ Screen Options ➤ Diagnostics ➤ System Information ➤ Load Cell Diagnostics ➤ Alarm and Event Log ➤ Hour Meters ➤ Communications ➤ MLAN I.D. Number ➤ TCP/IP Configuration ➤ Modbus Server ➤ Resets ➤ Restore Parameters ➤ Firmware Update ➤ Restore All ➤ Factory Access ➤ Access Control ➤ Key Features ➤ Access Levels ➤ Display Options ➤ Cycle Info ➤ Dispense Data ➤ HH Residence ➤ T4 Temperature ➤ Throughput ➤ Energy Usage ➤ Mouse Over	➤ <u>Print Center</u> ➤ Print Parameters ➤ Print Alarm History ➤ Print Events ➤ Print Events to .CSV ➤ Copy Log File ➤ Print All ➤ Clear All Alarms and Events
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Dryer Configuration Overview

The Dryer Configuration menu includes device specific settings such as: Alarm Setup, Auto-Stop setup, Dry Purge Setup, Preheat Setup, Auto-Start Setup, Convey Setup, Load-Cell Setup, and Parameters.

Alarm Setup	Material Shortage Alarm OFF: Disables the Material Shortage alarm <u>WARN:</u> In the event of a material shortage, activate the audible alarm and strobe light but continue retrying for material. SHUTDOWN: In the event of a material shortage, activate the audible alarm and strobe light and automatically initiate a planned shutdown. Audible alarm with sound for 15 seconds and the strobe will flash until the dryer is completely shut down. When Material Shortage Alarm is in Warn or Shutdown Mode Fill Retries are ENABLED. When set to OFF, Fill Retries are disabled. Material Ready Alarm - If the Material Ready alarm is enabled, this alarm will trigger after the first and only first batch of material has completed a full vacuum cycle. After 15 seconds, the audible portion of this alarm will automatically silence. The first batch of material will remain under vacuum indefinitely until this alarm is cleared. There are two main purposes of this alarm: 1. To alert the operator that dry material is ready for the process. 2. To act as a hold-back, when necessary, giving the operator additional time to prepare the process. <u>OFF:</u> Disables the Material Ready Alarm 1st: Material Ready Alarm sounds after the first and only the first batch of material is ready to drop from the Vacuum Chamber. Material Ready Alarm sounds after every batch of material is ready to drop from the Vacuum Chamber. ON: This mode can be useful in lab environments. Material Temperature Alarm - When the Material Temp alarm is enabled, during any instance where the Heating Hopper is called upon to dispense material into the vacuum chamber and the T3 (heating hopper exit) temperature is below the ESL parameter level, this alarm will trigger. Its purpose is to alert the operator that insufficient heating has occurred, most likely from a process throughput that exceeds the capacity of the ULTRA. ON: When the Material Temperature Alarm is enabled, the alarm will sound when this alarm is triggered. <u>OFF:</u> Disables the Material Temperature Alarm
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	Residence Alarm (labeled “Material Residence”) - When the Residence Alarm is enabled, an alarm will sound if dried material has sat in the retention hopper too long. The RAL parameter determines when a residence alarm will occur based on elapsed time and weight of remaining material in the retention hopper. See the RAL parameter for more information. ON: When the Residence Alarm is enabled, the alarm will sound when this alarm is triggered. OFF: Disables the Residence Alarm Throughput Alarm - If the Throughput alarm is enabled, the alarm will sound if the material in the Retention Hopper is used faster than the dryer can produce dried material. (Material level reaches RHL parameter before the Vacuum Time Setting expires VTS parameter) ON: If the Throughput alarm is enabled, the alarm will sound when this alarm is triggered. OFF: Disables the Throughput alarm Vacuum Chamber Dump Alarm - If the Vacuum Chamber Dump alarm is enabled, the dispensing of material from the vacuum chamber into the retention hopper is monitored using the CDR (Chamber Dump Retries) parameter. CDR's default settings of 05003 requires that at least 50% of the material that is in the vacuum chamber be detected in the retention hopper after the dispense. If it is under 50% the dispense will retry 3 times before triggering the alarm. Retries will continue indefinitely until 50% is satisfied. ON: If the Vacuum Chamber Dump alarm is enabled, the alarm will sound when this alarm is triggered. OFF: Disables both the vacuum chamber dump alarm and vacuum chamber Dump retries. Final Dispense Alarm ON: At the completion of the final vacuum chamber dispense of a given run cycle, an alarm will sound. OFF: Alarm disabled
Auto-Start Setup	Auto-Starts the Dryer at a specified Time and Day(s). Can be set to Auto-Start the Dryer at one time only or on a repeated schedule. Must be ENABLED in Display Setup.
Auto-Stop Setup	Auto-Stop the Dryer at a specified Time and Day(s). Can be set to Auto-Stop the Dryer at one time only or on a repeated schedule. Must be ENABLED in Display Setup.

Purge Setup	Purge Chamber - OFF/<u>CYC</u>/ON – Controls when the vacuum chamber is purged with membrane dried air. OFF – No vacuum chamber purging occurs. <u>CYC</u> - Vacuum chamber purging occurs during allotted vacuum cycle time (VTs). ON – Vacuum chamber purging occurs during allotted vacuum cycle time (VTs) and extended vacuum if applicable. Purge Interval - Interval in seconds between purges. Purge Duration - Duration in seconds that the purge will occur.
Convey Setup	Convey Setup - Material Convey Options - <u>Optional</u> - Uses dedicated outputs on the I/O board that may be used to control customer supplied Loader(s). Can be Conveyed Via Relays [R] where loaders are enabled and disabled via demand signal interrupt relays inside the ULTRA electrical cabinet or by FlexBus [FB] where connected FlexBus-capable receivers are controlled via the ULTRA dryer. For more information on conveying via FlexBus, refer to page 101. Loader #1 (Feed) Mode - refer to diagram on page 139 <u>Off</u> [R]: The Loader #1 demand signal interrupt relay is disabled. <u>Manual</u> [FB]: Receiver #1 is manually enabled/disabled from the FlexBus Lite receiver setup screen. <u>Auto</u> [R]: The Loader #1 demand signal interrupt relay will be energized if a Loader#1-driven AutoStop sequence has not commenced. <u>Auto</u> [FB]: Receiver #1 is enabled if a Receiver #1-driven Auto Stop sequence has not commenced. <u>Convey In Loop</u> [R]: The Loader #1's demand signal interrupt relay is controlled by Loader #2's logic. The Loader #1 material feed line is connected to the ULTRA's vacuum take-off. Material is moved in a loop. This is mode is usually for testing purposes. <u>Convey In Loop</u> [FB]: Receiver #1 is controlled by Receiver #2's logic. The Receiver #1 material feed line is connected to the ULTRA's vacuum take-off. Material is moved in a loop. This is mode is typically limited to testing purposes. Loader #2 (Take-Away) Mode [Relays] <u>Off</u> [Relays]: The Loader #2 demand signal interrupt relay is disabled. <u>Manual</u> [Flexbus]: Receiver #2 is manually enabled/disabled from the FlexBus Lite receiver screen. <u>Throughput</u> [R]: The Loader #2 demand signal interrupt relay will be energized if the amount of material in the retention hopper is at or above the amount specified by the LTP parameter. It will de-energize if the throughput drops below the amount specified by the LTC parameter.

	Throughput [FB]: Receiver #2 will be enabled if the amount of material in the retention hopper is at or above the amount specified by the LTP parameter. It will de-energize if the throughput drops below the amount specified by the LTC parameter. Weight [R]: The Loader #2 demand signal interrupt relay will be energized if the amount of material in the retention hopper is at or above the amount specified by the LTP parameter. It will de-energize if the amount of material in the retention hopper drops below the amount specified by the LTP parameter for the time specified by the LTP parameter. Weight [FB]: Receiver #2 will be enabled if the amount of material in the retention hopper is at or above the amount specified by the LTP parameter. It will be disabled if the amount of material in the retention hopper drops below the amount specified by the LTP parameter for the time specified by the LTP parameter. Reset Totalizer - Resets Weighed totals to zero. Totals are the amount of material that has been conveyed away from the dryer since the Totalizer has been reset.
Load cell Setup	Load cell Info – For instructions on how to calibrate the load cells on the ULTRA Dryer, see page 96.
Preheat Setup	Preheat Mode – Material preheats prior to a vacuum cycle Timed – Preheat based on a set time Auto (default) – Preheat dependent on a min. time and delta temp. Manual – Preheat until heater is turned off
Parameters	Dryer Parameters access. Parameters for the blower, heater, load cells, vacuum, system, and dispensing are found here. For information on how to change parameter settings, refer to page 50.
Special Features	Special Features that are exclusive to the ULTRA series of dryers can be enabled here. Batch Mode - refer to page 48 Auto Fill Adjust – dynamically adjust the vacuum chamber fill weight based on learned throughput to minimize the amount of retention hopper residence time. See page 48 for the software logic. Cycle Pause – freezes/pauses the vacuum timer while all other operations remain. Valve Clean Pause - refer to page 95 Cooldown Mode – refer to page 37 Running Contact – When the dryer is running, an output on the I/O board is energized. This can be, for example, tied into a customer's PLC. See I/O board wiring schematics on page 120 for ULTRA-600 and page 132 for ULTRA-1000. Mat. Outflow Valve – Optional material outflow valve located at the bottom of the retention hopper. Can be manually opened/closed from the 'Retention Hopper Setup' screen or controlled remotely when enabled from the 'Convey Setup' Screen. refer to page 49

Batch Mode

Batch Mode enables the dryer to dry a predetermined amount of material and then automatically stop and display a message indicating the batch is complete. To turn on Batch Mode see: Setup Menu > Dryer Configuration > Special Features > Batch Mode.

To enable and run the dryer in Batch Mode follow these steps from the Home Screen:

Press	Start Batch	Start Batch button is located on the Home Screen after Batch Mode is enabled. Display will show: Batch Start Options.
Press	Set Batch Target	Keypad screen will display. Enter Batch Weight.
Press		To save the batch weight or press the red X to cancel and exit.
Press	Reset Totalizer	to reset the totalized value back to zero (if applicable).
Press		To save the entered batch weight and begin the batch and start the Dryer. Press the red X to cancel.

Auto Fill Adjust

To enable this adjustment, Setup Menu / Dryer Configuration / Special Features / Auto Fill Adjust.

After the first cycle is complete, and before the next vacuum chamber fill, it begins calculating the throughput (since there is weight in the retention hopper). The throughput is calculated as follows:

- liw = accumulated loss in weight, since last cycle (grams)
- time = time since end of last cycle (seconds)

$$throughput \left(\frac{grams}{hour} \right) = \frac{liw (grams)}{time (seconds)} * \left(\frac{3600 seconds}{1 hour} \right)$$

The software takes the Vacuum Time in seconds (VTS parameter) and converts to minutes.

$$Fill Weight Adjusted(grams) = throughput \left(\frac{grams}{hour} \right) * \left(\frac{1 hour}{60 minutes} \right)$$

The value is again adjusted by 10% of its value.

$$New Fill Weight Adjusted (grams) = Fill Weight Adjusted (grams) * 1.1$$

The minimum value that the adjusted fill weight can be set to is 50lb.(22.7kg.) for an ULTRA-600 and ULTRA-1000. The value defaults to the minimum if the calculated value is lower.

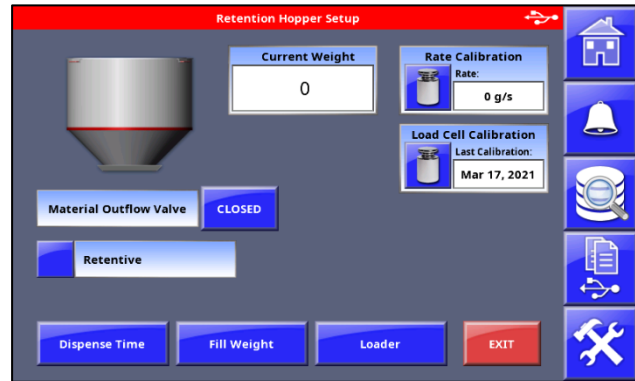
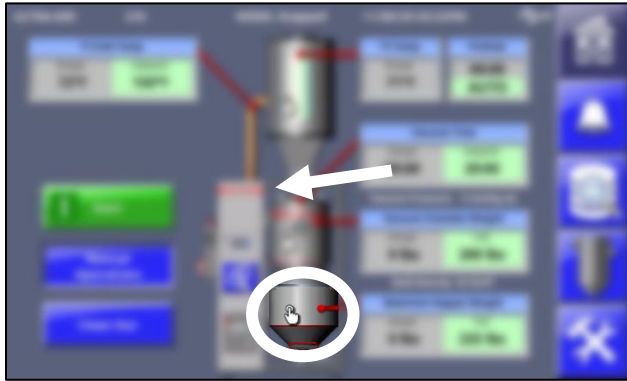
The software logic uses this new value as the target fill weight for the fill logic to use. This adjustment is applied to every fill after the first fill.

NOTE: Setting a new VCH value while 'Auto Fill Adjust' is enabled will force a fill with the new value of VCH as the target for one cycle before making future adjustments.

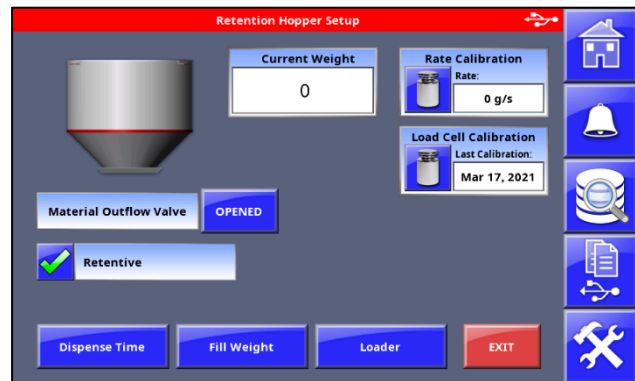
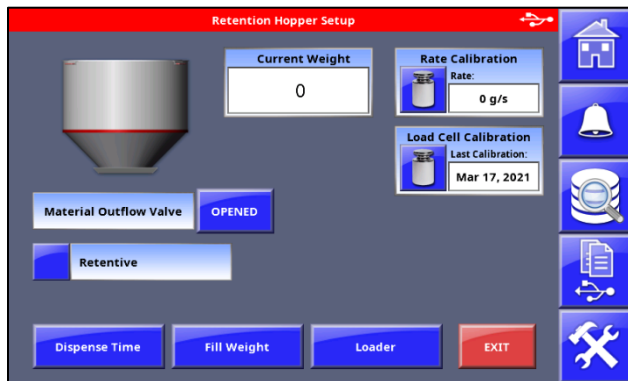
Material Outflow Valve

ULTRA-600 and ULTRA-1000 dryers are equipped with material outflow valves, located at the bottom of the retention hopper.

The settings for the material outflow valve can be controlled from the 'Retention Hopper Setup' screen (access from the home screen via the retention hopper icon). Default = CLOSED position.



Material outflow valve can be manually opened by pressing the 'CLOSED' button and toggling to 'OPENED'. When 'Retentive' is checked, an 'OPENED' setting survives power cycles; whereas with 'Retentive' being unchecked, does *not* survive power cycles.



This feature can also be controlled remotely when enabled from the 'Convey Setup' Screen.

Changing Parameters



Changing parameters can have an impact on the Dryers performance. It is highly recommended that a supervisor change the default Program Mode password to protect the values. Prior to making any changes, make sure it is understood what is being changed. If in doubt, contact a Maguire Dryer Technician before making changes to the dryer.

Navigating and Making Changes to Parameters:

Press		Display will prompt for a password. (default: 22222)	Then press:	
Press	Dryer Configuration	Display will show the Dryer Configuration categories.		
Press	Parameters	Display will show the categories of Parameters. Parameters are divided into 6 categories. Blower, Heater, System, Dispensing, Load-Cell, and Vacuum.		
Press	The category that would contain the parameter.	Categories will have several parameters indicated by a 3-letter acronym on the left of the screen. Some categories have multiple pages. Navigate pages using the arrow buttons at the lower-left of the screen.		
Press	The parameter	Display will show 5 digits. Press the up or down arrows to adjust.		
Press		To save the parameter adjustment or press the red X to cancel and exit.		

Parameters – Explained

All Maguire ULTRA controllers operate according to certain internal PARAMETERS. Because customer requirements vary widely, we have made parameters accessible for change through the keypad. In most cases, these parameters will never need to be changed. Some parameters that are routinely adjusted values are adjustable from the main display.

Blower Parameters:		Heater Parameters:	
BLF	VFD Low Limit	PTS	Preheat Temperature Setting
BHF	VFD High Limit	PHT	Preheat Time
BDF	VFD Frequency	PHD	Preheat Differential
BZL	VFD Zero Level	PTD	Preheat Target Delta
BLA	VFD Level Adjustment	RTS	Run Temperature Set-Point
BHT	VFD Heat Throttle	AS1	Anticipator Gain (Heater)
BMW	Blower Max Wattage	CF1	Cycle Frequency (Heater)
ADT	Airflow Delay Time	RU1	Rate of Correction Upward (Heater)
BDT	Blower Detect Time	RD1	Rate of Correction Downward (Heater)
Dispensing Parameters:		CH1	No Change High (Heater)
VCH	Vac. Chamber Hi Level	CL1	No Change Low (Heater)
VCL	Vacuum Chamber Low Level	PR1	Percent Reduction (Heater)
RHH	Ret. Hopper Hi Level	UT1	Update Time (Heater)
RHL	Retention Hopper Low Level	OT1	Over-Temp Alarm (Heater)
BLK	Bulk Density	NH1	No Heat Alarm (Heater)
VFR	Vacuum Chamber Fill Rate	MP1	Maximum Percentage
VDR	Vacuum Chamber Dump Rate	MAX	Maximum Temperature Setpoint
VFT	Vacuum Chamber Fill Time	ESL	Energy Saver Limit
VDT	Vacuum Chamber Dump Time	EST	Energy Saver Time
FLA	Fill Lag Time	ESP	Energy Saver Proportioning
DLA	Dump Lag Time	RMP	Temperature Ramp Settings
VGD	Vacuum Gate Delay	CTM	Cooldown Temperature
VFA	Chamber Fill Adjust	CTR	Cooldown Timer
HDD	Heating Hopper Dump Delay	H1W	Heater Wattage
VCT	Vacuum Chamber Dump Threshold	HCT	Heater Cooldown Time
CDR	Chamber Dump Reties	PGS	Temperature Setpoint (Purge Heater)
RAL	Residence Alarm	AS2	Anticipator Gain (Purge Heater)
BCH	Batch Size	CF2	Cycle Frequency (Purge Heater)
LTP	Loader Trip Point	RU2	Rate of Correction Upward (Purge Heater)
LTC	Loader Throughput Cutoff	RD2	Rate of Correction Downward (Purge Heater)
HHV	Heating Hopper Volume	CH2	No Change High (Purge Heater)
HHU	Heating Hopper High Level	CL2	No Change Low (Purge Heater)
HLA	Heating Hopper Level Alarm	PR2	Percent Reduction (Purge Heater)
L1T	Loader #1 Timings	UT2	Update Timer (Purge Heater)
L1A	Loader #1 Alarm	OT2	Over-Temp Alarm (Purge Heater)
L2T	Loader #2 Timings	NH2	No Heat Alarm (Purge Heater)
L2A	Loader #2 Alarm	DPD	Dry Purge Delay
L2D	Loader 2 Delay Time	PST	Purge and Shutdown Time
PMC	Progressively Metered Cycles	H2W	Heater Wattage (Purge Heater)
RLT	Rate Learning Threshold	Load Cell Parameters:	
Vacuum Parameters:		KDF	Load Cell Stable Wt.
VTs	Vacuum Time Setting	LST	Load Cell Stable Time
VPL	Vacuum Pressure Low	WST	Weight Settle Time
VPD	Vacuum Pressure Delta	LZT	Load Cell Zero Tolerance
VSO	Vacuum Shutdown Offset	LFC	Load Cell Filter Tolerance
LVT	Low Vacuum Timeout	System Parameters:	
NVT	No Vacuum Timeout	ELT	Event Logging Time
VPT	Chamber Purge Timer	EUS	Energy Usage Setting
VPI	Chamber Purge Interval		
ATM	Atmospheric Pressure		

Blower

BLF - Blower Low Frequency

format: xxxxxx (Hz)

function(s): Minimum allowable user-enterable blower drive frequency. *Note: this parameter is only visible on units equipped with a VFD.*

BHF - Blower High Frequency

format: xxxxxx (Hz)

function(s): Maximum allowable user-enterable blower drive frequency. *Note: this parameter is only visible on units equipped with a VFD.*

BDF - Blower Drive Frequency

format: xxxxxx (Hz)

function(s): VFD setpoint frequency. VFD frequency is directly proportional to blower RPM, which is directly proportional to airflow. *Note: this parameter is only visible on units equipped with a VFD.*

BZL - Blower Zero Level

format: xxxxxx (%)

function(s): When the heating hopper level is at or below this level, the blower will run at a reduced frequency set by the BLA parameter. *Note: this parameter is only visible on units equipped with a VFD.*

BLA - Blower Level Adjustment

format: xxxxxx (Hz)

function(s): Blower drive frequency when the heating hopper level is at or below that set by the BZL parameter. *Note: this parameter is only visible on units equipped with a VFD.*

BHT - Blower Heat Throttle

format: xxxxxx (%)

function(s): After a vacuum chamber fill , when the heater powers back up, it will run at this percentage of the duty cycle it ran at the end of the previous vacuum cycle if the heating hopper level is below that established by the BZL parameter. This is to mitigate temperature runaways caused by different airflows (caused by different pressure drops across the heating hopper). *Note: this parameter is only visible on units equipped with a VFD and a heating hopper level sensor.*

BMW - Blower Maximum Wattage

format: xxxxx (watts)

function(s): The amount of power the blower consumes when running at full speed. This value is used in energy consumption calculations.

ADT - Airflow Delay Time

format: xxxxx (seconds)

function(s): The amount of time between the completion of vacuum chamber re-filling and the blower powering-up

BDT - Blower Detect Time

format: xxxxx (seconds)

function(s): The amount of time between the powering of the blower and the triggering of a Blower Failure alarm should a running blower not be detected.

Dispensing

VCH - Vacuum Chamber High Level

format: xxxxx (lbs. or kgs.)

function(s): Vacuum chamber fill dispense target. Also known as “fill weight”.

VCL - Vacuum Chamber Low Level

format: xxxxx (lbs. or kgs.)

function(s): 1. When the dryer is started, if an amount of material equal or greater to this level is detected in the vacuum chamber, a “Warning: Material in Vacuum Chamber” message will pop up.

2. When in Clean-Out mode, the vacuum chamber fill valve will not open automatically until the vacuum chamber weight reading is at or below this level.

3. The minimum allowable final dispense of a standard Auto Stop.

RHH - Retention Hopper High Level

format: xxxxx (lbs. or kgs.)

function(s): Retention hopper fill dispense target. This value is typically slightly higher than VCH to ensure that 100% of the vacuum chamber contents dispense into the retention hopper.

RHL - Retention Hopper Low Level

format: xxxxx (lbs. or kgs.)

function(s): 1. When the dryer is started, if an amount of material equal or greater to this level is detected in the retention hopper, a “Warning: Material in Retention Hopper” message will pop up.

2. When in Clean-Out mode, the vacuum chamber dump valve will not open automatically until the retention hopper weight reading is at or below this level.

3. When the dryer is running, the retention hopper must be depleted down to this level before a vacuum chamber dump is allowed.

BLK - Bulk Density

format: xxxxx (lbs./ft³ or g/L)

function(s): User-enterable material bulk density. Setting this parameter to match the material being dried ensures that a fill weight that could potentially overflow the vacuum chamber cannot be entered. Note that this parameter has no effect on drying.

VFR - Vacuum Chamber Fill Rate

format: xxxxx (g/sec.)

function(s): Starting flow rate of the vacuum chamber fill valve. This rate will be adjusted in the background over time.

VDR - Vacuum Chamber Dump Rate

format: xxxxx (g/sec.)

function(s): Starting flow rate of the vacuum chamber dump valve. This rate will be adjusted in the background over time.

Note: this parameter is typically set to 00000, which means that rate learning does NOT occur, and vacuum chamber dumps will terminate on low flow or high level (RHH). Manually setting this parameter to any value other than zero will enable rate learning.

VFT - Vacuum Chamber Fill Time

format: xxxxx (seconds)

function(s): 1. When the most significant digit is set to a 0 (0xxxx), this is the maximum allowable vacuum chamber fill time. Fills and retries are not allowed to go beyond this time.

2. When the most significant digit is set to a 1 (1xxxx), this is the vacuum chamber fill time. VFR is ignored. However, the timed fill will terminate prematurely if VCH is reached.

3. When the most significant digit is set to a 2 (2xxxx), this is the vacuum chamber fill time. VFR is ignored. This is also known as "Volumetric Fill Mode".

VDT - Vacuum Chamber Dump Time

format: xxxxx (seconds)

function(s): 1. When the most significant digit is set to a 0 (0xxxx), this is the maximum allowable vacuum chamber dump time. Dumps and retries are not allowed to go beyond this time.

2. When the most significant digit is set to a 1 (1xxxx), this is the vacuum chamber dump time. VDR is ignored. However, the timed dump will terminate prematurely if RHH is reached.

3. When the most significant digit is set to a 2 (2xxxx), this is the vacuum chamber dump time. VDR is ignored. This is also known as "Volumetric Dump Mode".

FLA - Fill Lag Time

format: xxxxx (milliseconds)

function(s): Amount of time added to every vacuum chamber fill valve opening. This is to account for the delay between the controller signaling the opening of the valve and the first pellets beginning to flow. This can also be considered the minimum vacuum chamber fill valve open time.

DLA - Dump Lag Time

format: xxxxx (milliseconds)

function(s): Amount of time added to every vacuum chamber dump valve opening. This is to account for the delay between the controller signaling the opening of the valve and the first pellets beginning to flow. This can also be considered the minimum vacuum chamber dump valve open time.

VGD - Vacuum Gate Delay

format: xxxyy (seconds / seconds)

function(s): xxx: The amount of time between the lower vacuum valve opening and the vacuum chamber dump valve opening.

yy: The amount of time between upper vacuum gate opening and the vacuum chamber fill valve opening.

VFA - Vacuum Fill Adjust

format: xxyyy (retries, 10ths of pounds or 10ths of kilograms)

function(s): xx: The number of vacuum chamber fill retries that will be attempted before a material shortage alarm is triggered

yyy: The allowable negative deviation from the vacuum chamber fill target (VCH). If, after a vacuum chamber fill, the vacuum chamber weight reading is not within this tolerance, a fill retry will be initiated.

HDD - Heating Hopper Dump Delay

format: xxxxx (seconds)

function(s): The amount of time between blower shutdown and the initiation of a vacuum chamber fill. This is to allow for blower wind-down time.

VCT - Vacuum Dump Threshold

format: xxxxx (g/sec.)

function(s): During a vacuum chamber dump, if the real-time vacuum chamber dump valve flow rate reaches this low level, the dump will be terminated on the assumption that the vacuum chamber is completely empty.

CDR - Chamber Dump Retries

format: xxxyy (% / retries)

function(s): xxx: If a vacuum chamber dump does not reach at least this percentage of the target (RHH), a vacuum chamber dump retry is initiated.

 yy: The number of vacuum chamber dump retries that will occur before a Vacuum Chamber Dump Alarm is triggered.

RAL - Residence Alarm

format: xxyyy (pounds or kilograms / minutes)

function(s): xx: If at least this amount of material is not evacuated from the retention hopper within the amount of time shown in (yyy) below, a Residence Time alarm will trigger.

 yyy: Residence Time alarm time.

Note: This parameter is only active when the Residence Time alarm is enabled.

BCH - Batch Mode Target

Format: xxxxx (pounds or kilograms)

function(s): The targeted total amount of material that will be dried during a batch run.

LTP - Loader Trip Point

format: xxyyy (seconds / 10ths of pounds or 10ths of kilograms)

function(s): xx: loader #2 off-delay timer

 yyy: If the retention hopper contents drop below this level, initiate the de-powering of the loader #2 output.

LTC - Loader Throughput Cutoff

format: xxxxx (pounds or kilograms per minute)

function(s): When loader #2 is set to Throughput cutoff mode, the loader output will de-energize when the throughput drops below this level.

HHV - Heating Hopper Volume

format: xxxxx (10ths of cubic feet or 10ths of liters)

function(s): Volume of the heating hopper. This value is used to estimate the total amount of material in the dryer, which is used in the Loader #1 triggered Auto Stop calculation.

HHU - Heating Hopper High Level

format: xyyyy (% / %)

function(s): xx: Heating hopper material level deadband.

yyy: When Loader #1 is set to “Auto” mode, the Loader #1 output will de-energize when the heating hopper material level reaches this point.

Note: this parameter is only visible on units equipped with a heating hopper level sensor.

HLA - Heating Hopper Level Alarm

format: xxxxx (%)

function(s): If the heating hopper material drops to this level, the heating hopper level alarm will be triggered (if enabled).

Note: this parameter is only visible on units equipped with a heating hopper level sensor.

L1T - Loader #1 Timings

format: xyyyy (seconds / seconds)

function(s): xx: Loader #1 ON time

yyy: Loader #1 OFF time.

Note: Loader #1 must be set to “Internal” mode for this parameter to have effect.

L1A - Loader #1 Alarm

format: xxxxx (counts)

function(s): Number of failed load attempts after which a Loader #1 alarm is triggered.

Note: Loader #1 must be set to “Internal” mode for this parameter to have effect.

L2T - Loader #2 Timings

format: xxyyy (seconds / seconds)

function(s): xx: Loader #2 ON time

 yyy: Loader #2 OFF time.

 Note: Loader #2 must be set to “Internal” mode for this parameter to have effect.

L2A - Loader #2 Alarm

format: xxxxx (counts)

function(s): Number of failed load attempts after which a Loader #2 alarm is triggered.

 Note: Loader #2 must be set to “Internal” mode for this parameter to have effect.

L2D - Loader #2 Delay Time

format: xxxxx (seconds)

function(s): The amount of time, after a vacuum chamber dump, between weight being sensed in the retention hopper and loader #2 turning on. A delay here ensures that material is not being conveyed away during the dump, which could cause throughput and totalizer reading inaccuracies.

PMC - Progressively Metered Cycles

format: xxyyy (counts / percentage)

function(s): xx: Number of cycles to meter for initial rate adjustments.

 yyy: Percentage of threshold weight to target during initial metered cycles.

RLT - Rate Learning Threshold

format: xxxxx (%)

function(s): Percentage of dispense target that must be achieved via a given fill attempt in order for a rate adjustment to occur.

Heater

PTS - Preheat Temperature Setpoint

format: xxxxx (°F or °C)

function(s): Target heating hopper air inlet temperature during preheat (when the Preheat Setpoint is set to “Temperature”).

PHT - Preheat Time

format: xxxxx (minutes)

function(s): 1. When Preheat mode is set to “Auto”, this is the *minimum* preheat duration.
 2. When Preheat mode is set to “Timed”, this is the preheat duration.

PHD - Preheat Differential Temperature

format: xxxxx (°F or °C)

function(s): When Preheat Setpoint mode is set to “Differential”, the preheat temperature is automatically set to this number of degrees below the run temperature (RTS).

PTD - Preheat Target Delta

format: xxxxx (°F or °C)

function(s): When Preheat mode is set to “Auto”, the preheat will automatically terminate when the heating hopper exit air temperature is within this number of degrees of the preheat temperature, assuming PHT has expired.

RTS - Run Temperature Setting

format: xxxxx (°F or °C)

function(s): Target heating hopper air inlet temperature during preheat (when Preheat Setpoint is set to “Same as Run Temp.”) and during all subsequent heating cycles.

AS1 - Anticipator Gain (Heater)

format: xxxxx (number)

function(s): Anticipator influence gain. This determines how much of an effect the anticipated future temperature has on heater power level adjustments. Higher values will result in a more conservative heat control loop.

CF1 - Cycle Frequency (Heater)

format: xxxxx (°F or °C)

function(s): Loop update time exception. If a rise in temperature above this value occurs within a given loop update period, a loop update will happen sooner.

RU1 - Rate of Correction Upward (Heater)

format: xxxxx (%)

function(s): Damping factor applied to periods of control that have an anticipated temperature below setpoint. Higher values will result in a more conservative temperature rise.

RD1 - Rate of Correction Downward (Heater)

format: xxxxx (%)

function(s): Damping factor applied to periods of control that have an anticipated temperature above setpoint. Higher values will result in a less conservative temperature drop.

CH1 - No Change High (Heater)

format: xxxxx (1/10th °F or °C)

function(s): Above-setpoint deadband. Expressed in tenths of a degree.

CL1 - No Change Low (Heater)

format: xxxxx (1/10th °F or °C)

function(s): Below-setpoint deadband. Expressed in tenths of a degree.

PR1 - Percent Reduction (Heater)

format: xxxxx (%)

function(s): Special-case heat reduction percent. If the actual temperature is more than OT1 above setpoint, the heater duty cycle will be reduced by this amount.

UT1 - Update Timer (Heater)

format: xxxxx (seconds)

function(s): Normal heat control loop update time.

OT1 - Over-Temp Alarm (Heater)

format: xxyyy (seconds / °F or °C)

function(s): xx: Amount of time that the heating hopper inlet air temperature must be above setpoint before a H1 reduction equal to PR1 is triggered. Note: if (3) successive PR1 reductions occur, a Heating Hopper Over-Temperature alarm is triggered.

 yyy: Number of degrees that the heating hopper inlet air temperature must be above setpoint for the above to occur.

NH1 - No Heat Alarm (Heater)

format: xxxxx (seconds)

function(s): Maximum amount of time after a heat cycle begins during which one of the following two conditions must be detected:

1. the temperature must climb 20 degrees
2. the temperature must move at least 20 percent toward the target

If neither condition is met, a “NO HEAT” alarm will be triggered.

MP1 - Maximum Percentage (Heater)

format: xxxxx (%)

function(s): Maximum allowable heater duty cycle. This can be used to effectively limit the effective size of the heater.

Note: When the blower is driven by a VFD, this parameter is automatically scaled proportionally to the blower frequency (BDF or BLA). When blower is line-powered, this parameter is automatically scaled proportionally to the line frequency (50 Hz or 60 Hz).

MAX - Maximum Temperature Setpoint

format: xxxxx (°F or °C)

function(s): Maximum allowable user-enterable preheat and run temperature setpoints. Used to limit how high an operator can set the drying temperatures.

ESL - Energy Saver Limit

format: xxxxx (°F or °C)

function(s): The heating hopper exhaust air temperature at which Energy Saver mode will kick in if set to “Limit” mode.

EST - Energy Saver Time

format: xxyyy (minutes / minutes)

function(s): xx: Beginning-of-cycle Energy Saver black-out time. Energy Saver is inhibited for this amount of time at the beginning of a heat cycle.

 yyy: If this amount of time elapses after Energy Saver kicks in during a heat cycle, the blower and heater will power-up to bring the heating hopper back up to temperature.

ESP - Energy Saver Proportioning

format: xxyyy (minutes / %)

function(s): xx: Minimum beginning-of-cycle heater OFF time when Energy Saver is set to Dynamic mode

 yyy: Beginning-of-cycle heater OFF time percentage when Energy Saver is set to Dynamic mode

RMP - Temperature Ramp Settings

format: xyyzz (increments / minutes / °F or °C)

function(s): x: Number of temperature steps during a temperature ramp.

 yy: Duration of a temperature ramp.

 zz: Temperature span of a temperature ramp.

CTM - Cooldown Temperature

format: xxxxx (°F or °C)

function(s): Heating hopper cooldown temperature target.

Note: Cooldown mode must be enabled for this parameter to have effect.

CTR - Cooldown Timer

format: xxxxx (minutes)

function(s): Heating hopper cooldown time.

Note: Cooldown mode must be enabled for this parameter to have effect.

H1W - Heater Wattage (Heater)

format: xxxxx (Watts)

function(s): Wattage of the primary heater. This value is used in energy consumption calculations.

HCT - Heater Cooldown Time (Heater)

format: xxxxx (seconds)

function(s): xx: The amount of time between the blower powering down and the heater powering down.

PGS - Temperature Setpoint (Purge Heater)

format: xxxxx (°F or °C)

function(s): Purge / blanketing air setpoint temperature.

AS2 - Anticipator Gain (Purge Heater)

format: xxxxx (number)

function(s): Anticipator influence gain. This determines how much of an effect the anticipated future temperature has on heater power level adjustments. Higher values will result in a more conservative heat control loop.

CF2 - Cycle Frequency (Purge Heater)

format: xxxxx (°F or °C)

function(s): Loop update time exception. If a rise in temperature above this value occurs within a given loop update period, a loop update will happen sooner.

RU2 - Rate of Correction Upward (Purge Heater)

format: xxxxx (%)

function(s): Damping factor applied to periods of control that have an anticipated temperature below setpoint. Higher values will result in a more conservative temperature rise.

RD2 - Rate of Correction Downward (Purge Heater)

format: xxxxx (%)

function(s): Damping factor applied to periods of control that have an anticipated temperature above setpoint. Higher values will result in a less conservative temperature drop.

CH2 - No Change High (Purge Heater)

format: xxxxx (1/10th °F or °C)

function(s): Above-setpoint deadband. Expressed in tenths of a degree.

CL2 - No Change Low (Purge Heater)

format: xxxxx (1/10th °F or °C)

function(s): Below-setpoint deadband. Expressed in tenths of a degree.

PR2 - Percent Reduction (Purge Heater)

format: xxxxx (%)

function(s): Special-case heat reduction percent. If the actual temperature is more than OT1 above setpoint, the heater duty cycle will be reduced by this amount.

UT2 - Update Timer (Purge Heater)

format: xxxxx (seconds)

function(s): Normal heat control loop update time.

OT2 - Over-Temp Alarm (Purge Heater)

format: xxyyy (seconds / °F or °C)

function(s): xx: Amount of time that the purge air temperature must be above setpoint before a H2 reduction equal to PR2 is triggered. Note: if (3) successive PR2 reductions occur, a Purge Heater Over-Temperature alarm is triggered.

 yyy: Number of degrees that the purge air temperature must be above setpoint for the above to occur.

NH2 - No Heat Alarm (Purge Heater)

format: xxxxx (seconds)

function(s): Maximum amount of time after the purge heat cycle begins during which one of the following two conditions must be detected:

1. the purge air temperature must climb 20 degrees
2. the purge air temperature must move at least 20 percent toward the target

If neither condition is met, a "NO HEAT" alarm will be triggered.

DPD - Dry Purge Delay

format: xxyyy (seconds / seconds)

function(s): xx: The amount of time between the purge air solenoid valve opening and the purge air heater powering-up

yyy: The amount of time between the purge air heater powering-down and the purge air solenoid valve closing.

PST - Purge and Shutdown Time

format: xxxxx (minutes)

function(s): The amount of time that the purge air system will continue to run after the final vacuum chamber dispense.

H2W - Heater Wattage (Purge Heater)

format: xxxxx (watts)

function(s): Wattage of the purge heater. This value is used in energy consumption calculations.

Load Cell

KDF -Load Cell Stable Weight

format: xxxxx (counts)

function(s): Maximum allowable load cell fluctuations during a weight reading during zero and full calibrations.

LST -Load Cell Stable Time

format: xxxxx (milliseconds)

function(s): The amount of time that the load cell raw counts must remain within the window established by KDF before a weight reading is taken.

WST -Weight Settle Time

format: xxxyy (seconds / seconds)

function(s): xxx: The amount of time between the closing of the vacuum chamber fill valve and the recording of the vacuum chamber load cell reading. This is to allow for settling of the vacuum chamber load cell reading.

yy: The amount of time between the closing of the retention hopper fill valve and the recording of the retention hopper load cell reading. This is to allow for settling of the retention hopper load cell counts.

LZT - Load Cell Zero Tolerance

format: xxxxx (%)

function(s): Allowable +/- deviation from established nominal load cell zero count values.
Note: Setting this parameter to 00000 disables deviation checking.

LFC - Load Cell Filter Configuration

format: xyyzz (# / bits / samples)

function(s): x: Disable (0) or enable (1) load cell diagnostic event logging.

yy: Number of non-masked load cell raw count bits

zz: Number of samples used in the load cell raw count filtering array.

Vacuum

VTs -Vacuum Time Setting

format: xxyyy (minutes / minutes)

function(s): xx: Minimum user-enterable vacuum cycle time.

 yyy: Vacuum cycle time.

VPL -Vacuum Pressure Low

format: xxxxx (mm Hg absolute)

function(s): Vacuum chamber pressure setpoint.

VPD -Vacuum Pressure Delta

format: xxyyy (seconds / mm Hg)

function(s): xx: Amount of time the vacuum generator will continue to run after VPL is reached.

 yyy: Vacuum pressure deadband / hysteresis.

VSO -Vacuum Shutdown Offset

format: xxxxx (seconds)

function(s): Amount of time before the vacuum time (VTS) expires that vacuum pressure equalization begins. This is to compensate for equalization time.

LVT -Vacuum Shutdown Offset

format: xxxxx (seconds)

function(s): Amount of time the vacuum generator will run before a LOW VACUUM condition check is made. See LOW VACUUM alarm in Alarms section.

NVT - No Vacuum Timeout

format: xxyyy (counts / seconds)

function(s): xx: Number of vacuum gate recycle attempts that will be made in an attempt to clear a vacuum fault before a NO VACUUM alarm is triggered.

 yyy: Amount of time the vacuum generator will run before a NO VACUUM condition check is made. See NO VACUUM alarm in Alarms section.

VPT - Vacuum Purge Timer

format: xxxyyy (seconds)

function(s): xx: Additional time the vacuum chamber purge/equalization valve will remain open after the vacuum chamber reaches equalization pressure when in Vacuum Test mode. This is to ensure that the vacuum chamber is not left under a partial vacuum state at the end of a subsequent vacuum cycle.

 yyy: Additional time the vacuum chamber purge/equalization valve will remain open after the vacuum chamber reaches equalization pressure when in Auto mode.

VPI - Vessel Purge Interval

format: xxyyy (seconds / seconds)

function(s): xx: Percentage of the evacuated atmosphere that will be replaced during a purge.

 yyy: Interval between vacuum chamber purge cycles.

ATM - Atmospheric Pressure

format: xxxxx (mm Hg absolute)

function(s): The measured atmospheric pressure. This parameter is automatically updated once per cycle.

System**ELT - Event Logging Time**

format: xxxxx (seconds)

function(s): The amount of time between event log data line entries.

EUS - Energy Usage Settings

format: xxyyy (10ths of hours / seconds)

function(s): xx: Length of energy consumption averaging array.

 yyy: Amount of time between instantaneous energy consumption readings. These readings populate the energy consumption averaging array.

System Configuration Overview

The System Configuration menu is accessible from the setup menu screen and includes system wide general settings such as: Data logging, preferences, diagnostics, rests, and communications. Below is a general overview of the options that are located within the system configuration menu.

System Preferences

Change Passwords - Sets the Setup Menu Password. Default password is 22222. Setting the password to 00000 disables password protection.

Date and Time - Set time, date, and date format.

Display Units: Fahrenheit (°F) or Celsius (°C), Pounds (lbs) or Kilograms (kgs), Pressure: Absolute or Differential, Pressure units: mmHg or inHg.

Language – Set current language.

Navigation Bar Options – Configure right-side soft keys.

Screen Options – Screen Saver options, Screen Brightness, Screen Calibration and On-Screen Options. On-Screen Options is information shown across the top of the home screen including: Date/Time, Model Number, MLAN ID, USB Connectivity, Ethernet Connectivity.

Screen calibration can also be performed by pressing and holding the touchscreen anywhere while turning the power ON.

Diagnostics

System Information – System Information displays specific system related information about the controller and Dryer.

Load-Cell Diagnostics – Displays Vacuum Chamber and Retention Hopper loadcell diagnostics information.

Alarm and Event Log – Displays the Alarm and Event Log screen. See page 78 for more details

Hour Meters – Logs processing/running time of the machine. Maintenance Hour Meter is resettable.

Communications

Dryer I.D. Number – Sets the dryer ID number. Enter an identification number for this particular ULTRA dryer. This I.D. number will appear on all printed reports. If more than one unit is present, this helps to identify reports. If using the MLAN Protocol to automatically gather data, then each controller must have a unique address. Valid numbers are 000 to 255.

Modbus Server – Enable or disable Modbus TCP.

TCP/IP Configuration – Enable DHCP or set a static IP address, subnet mask and default gateway.

For more information on communications see page 73.

Resets

Factory Access – For factory access only.

Restore All – Restores Factory Defaults.

WARNING: Only do a 'Restore All' when directed by a Maguire Technician.

Restore Parameters – Resets parameters back to factory defaults.

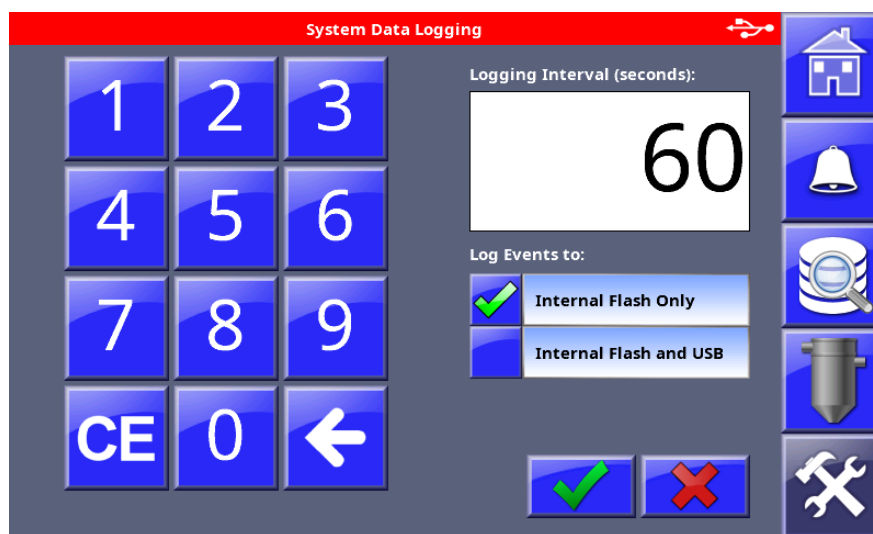
Firmware Update - Update ULTRA-600/1000 firmware. See page 100.

Data Logging

The Maguire ULTRA touchscreen controller gives the user a few options on how to log events from the machine and where to save such events. Once accessing the 'System Configuration' menu, the user can access the Data Logging Menu.

The user will be taken to the following screen (shown below), to toggle between 'Internal Flash Only' and 'Internal Flash and USB'.

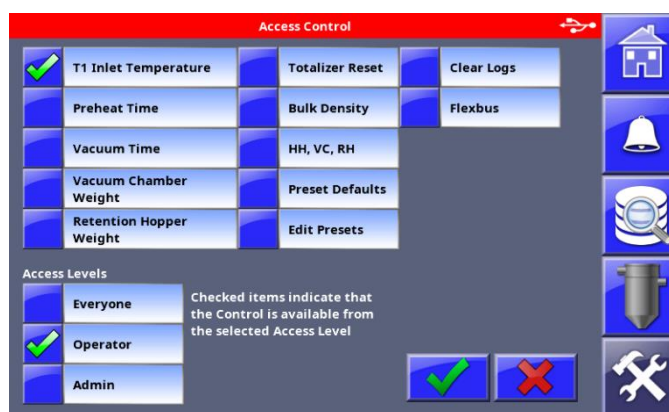
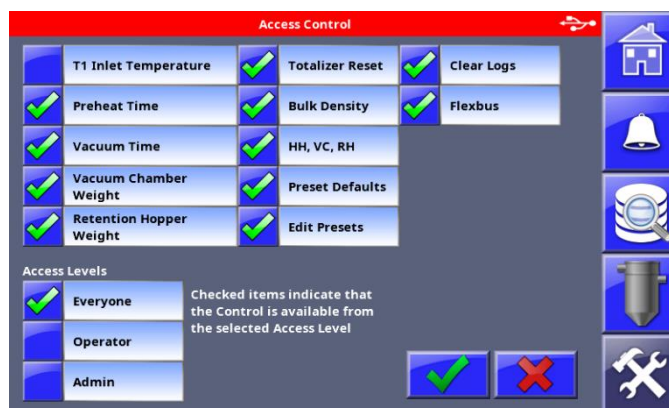
With the '**Internal Flash and USB**' checked, events will print to a USB flash drive, if one is present. A file named, "ULT_DIAG.TXT" and "ULT_DIAG.CSV" will be saved in the /MAGUIRE directory.



NOTE: maximum USB flash drive size is 32 GB.

Access Control

The Access Control menu allows for password protection to be added to key features of the ULTRA drying process. Within each 'Access Level' if the features has a green checkmark, then it applies to that current access level. For example, if every feature is checked within the 'Everyone' category, then there is no password protection for any of the features. If password protection was desired for 'T1 Inlet Temperature' then it needs to be un-checked from the 'Everyone' level and enabled within either the 'Operator' or 'Admin' level.



Display Options

Display Options – Show/Hide info and options on the controller screens.

- **Cycle Info - ON/OFF** – Displays Cycle info on main screen.
- **Dispense Time - ON/OFF** – Displays the fill time on main screen.
- **HH Residence - ON/OFF** – When ON, displays a countdown timer (RAL parameter) indicating when an alarm will sound alerting that material has sat in the retention hopper too long.
- **Show Throughput** – Displays throughput (lbs or kgs per hour)
- **Show T4 Temperature** - Displays actual temp., if equipped.
- **Energy Usage – ON/OFF** – Toggles the energy usage and is viewable in the Advanced Information menu on the home screen.
- **Mouse Over – ON/OFF** - Mouse icon on home screen chambers toggles on and off. This is purely for visual aesthetics.

Communications Setup

ULTRA-600/1000 communications enabled software communication over Ethernet using the MLAN Protocol. For more information about the MLAN Protocol and the ULTRA-600/1000 Dryer see the MLAN Protocol manual, available on the Maguire Products, Inc. website.



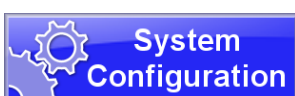
MLAN communications over Ethernet use port 9999 to communicate.
Modbus communications, when enabled (see below), use port 502.

NOTE

Setting the MLAN ID Number

Press		Display will prompt for a password. (default: 22222)	Then press:	
Press		Display will show the System Configuration categories.		
Press	Communications	Display will show the System Communications categories.		
Press	MLAN I.D. Number	Display will show the MLAN I.D. Number screen.		
		On this screen, enter the new ID number using the keypad. Valid I.D. numbers are 1 through 254.		
Press		To save the Changes.		

Setting the IP Address, Subnet Mask, Gateway

Press		Display will prompt for a password. (default: 22222)	Then press:	
Press		Display will show the System Configuration categories.		
Press	Communications	Display will show the System Communications categories.		
Press	TCP/IP Configuration	Display will show the TCP/IP Configuration screen. On this screen, enter the IP Address, Subnet Mask and Default Gateway. Use the keypad to enter the number into the field highlighted in green. To advance to the next field, touch the field to edit and type the desired value.		
Press		To save the Changes.		

Enabling Modbus

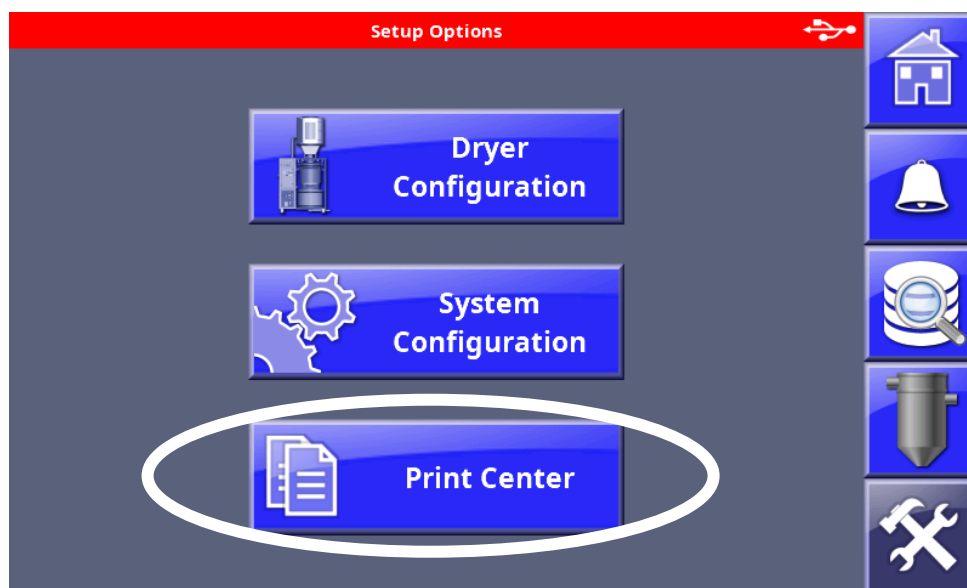
Press		Display will prompt for a password. (default: 22222)	Then press:	
Press		Display will show the System Configuration categories.		
Press	Communications	Display will show the System Communications categories.		
Press	Modbus Server	Display will show the Modbus Server screen. On this screen, press the checkbox Enable to enable Modbus.		
Press		To save the Changes.		

Print Center Overview



Print Center is available from the Home Screen by pressing the Print Center button. Print Center displays a menu screen of print related options including Parameters, Events and Alarms, raw data log file and Alarm History. To print the Alarm Log, Parameters or Event Log a USB Flash Drive must be plugged into the ULTRA.

The Print Center can also be accessed from the 'Setup' Menu as shown below



NOTE: maximum USB flash drive size is 32 GB.

Files will be created on the flash drive in the root of the drive.

ULT_ALARM.TXT - Alarm Log
 ULT_EVNT.CSV – Event Log (.CSV)
 ULT_EVNT.TXT – Event Log
 ULT_PARM.TXT – Parameter Log

Print Parameters	Prints the full parameter and values as well as other info to the USB flash drive.
Print Events	A combination of status lines at defined intervals as well as mechanical events.
Print Alarm History	Prints to USB any alarms recorded since the alarm log was last cleared.
Print Events to .CSV	Exports data to .CSV file.
Copy Log File	Copies raw log file to USB stick for analysis by a Maguire technician.
Print All	Prints all the above logs to USB.
Clear All Alarms and Events	Clears all alarms and events that are stored locally and erases the log.

Parameter Printout – Example

*An asterisk next to a value in the ‘setting’ column indicates that the parameter has been changed from its default value.

Parameter Report

Printed 05/24/21 10:01AM
 Model: ULTRA-600
 HMI Core: 4357 (Touchscreen)
 HMI Firmware: U0514A
 I/O Firmware: U0514A
 HMI Bootloader: 2.26
 I/O Bootloader: 1.03
 Serial#: 000000-00
 MAC Address: 00:1C:1A:00:7B:68
 A-to-D Communication: UART

INDEX	NAME	ABBR	SETTING	DEFAULT	MIN	MAX	UNITS
Blower:							
B1	VFD Low Limit	BLF	00025	00025	00025	00060	Freq
B2	VFD High Limit	BHF	00060	00060	00050	00070	Freq
B3	VFD Drive	BDF	00040	00040	00000	99999	Freq
B4	VFD Zero Level	BZL	00045	00045	00000	00100	Percent
B5	VFD Level Adjustment	BLA	00025	00025	00025	00060	Freq
B6	VFD Heat Throttle	BHT	00100	00100	00000	99999	Percent
B10	Blower Max Wattage	BMW	08000	08000	00000	99999	Watts
B11	Airflow Delay Time	ADT	00000	00000	00000	99999	Second
B12	Blower Detect Time	BDT	00010	00010	00000	99999	Second
Dispensing:							
D1	Vacuum Chamber High Level	VCH	00150*	00200	00000	00192	Weight
D2	Vacuum Chamber Low Level	VCL	00015	00015	00000	00050	Weight
D3	Retention Hopper High Level	RHH	00175*	00225	00000	00214	Weight
D4	Retention Hopper Low Level	RHL	00015	00015	00000	00150	Weight
D5	Material Bulk Density	BLK	00035	00035	00000	00150	Wt/Vol
D6	Vacuum Chamber Fill Rate	VFR	08041*	10000	02500	15000	Gram/Sec
D7	Vacuum Chamber Dump Rate	VDR	00000	00000	00000	15000	Gram/Sec
D8	Chamber Fill Time	VFT	00025	00025	00000	99999	Second
D9	Chamber Dump Time	VDT	00060	00060	00000	99999	Second
D10	Fill Lag Time	FLA	00400	00400	00000	01000	Time
D11	Dump Lag Time	DLA	00300	00300	00000	01000	Time
D12	Vacuum Gate Delay	VGD	00404	00404	00000	99999	Second
D13	Chamber Fill Adjust	VFA	04050	04050	00000	99999	Cnt/Wt
D14	Heat Hopper Dump Delay	HDD	00015	00015	00000	99999	Second
D15	Vacuum Dump Threshold	VCT	00250	00250	00000	99999	Gram/Sec
D16	Chamber Dump Retries	CDR	05003	05003	00000	10099	Pct/Ret
D17	Residence Alarm	RAL	20120	20120	00000	65999	Wt/Min
D18	Batch Size	BCH	00000	00000	00000	99999	Weight
D19	Loader Trip Point	LTP	15050	15050	00000	99250	Time/Wt
D20	Loader Throuput Cutoff	LTC	00005	00005	00000	99999	Wt/Min
D21	Heat Hopper Volume	HHV	00120	00120	00000	99999	Volume
D24	Loader 2 Delay Time	L2D	00030	00030	00000	99999	Second
D25	Progressively Metered Cycles	PMC	01060	01060	00000	99999	Cnt/Pct
D26	Rate Learning Threshold	RLT	00025	00025	00000	99999	Percent
Heater:							
H1-1	Preheat Temperature	PTS	00180*	00150	00074	00437	Degree
H1-2	Preheat Time	PHT	00010*	00060	00001	00999	Minute
H1-3	Preheat Differential	PHD	00020	00020	00001	00999	Degree
H1-4	Preheat Target Delta	PTD	00030	00030	00000	99999	Degree
H1-5	Run Temperature	RTS	00180*	00150	00074	00437	Degree
H1-6	Anticipator Gain (Heater)	AS1	00150	00150	00000	99999	Number
H1-7	Cycle Frequency (Heater)	CF1	00010	00010	00000	99999	Degree
H1-8	Rate of Correction Upward (Heater)	RU1	00006	00006	00000	99999	Percent
H1-9	Rate of Correction Downward (Heater)	RD1	00005	00005	00000	99999	Percent
H1-10	No Change High (Heater)	CH1	00005	00005	00000	99999	1/10th Degree
H1-11	No Change Low (Heater)	CL1	00010	00010	00000	99999	1/10th Degree
H1-12	Percent Reduction (Heater)	PR1	00005	00005	00000	99999	Percent
H1-13	Update Timer (Heater)	UT1	00010	00010	00000	99999	Second
H1-14	Over-Temp Alarm (Heater)	OT1	10009	10009	00000	99999	Sec/Deg
H1-15	No Heat Alarm (Heater)	NH1	00180	00180	00000	99999	Second
H1-16	Maximum Percentage (Heater)	MP1	00066*	00100	00000	99999	Percent
H1-17	Max Temperature Set-Point	MAX	00350	00350	00074	00374	Degree
H1-18	Energy Saver Limit	ESL	00115	00115	00095	00115	Degree
H1-19	Energy Saver Time	EST	05030	05030	00000	99999	Min/Min
H1-20	Energy Saver Proportioning	ESP	02060	02060	00000	60999	Min/Pct
H1-21	Temperature Ramp Settings	RMP	52036	52036	00000	99999	Inc/Min/Deg
H1-22	Cooldown Temperature	CTM	00120	00120	00032	00300	Degree
H1-23	Cooldown Timer	CTR	00060	00060	00000	99999	Minutes
H1-24	Heater Wattage (Heater)	HIW	20000	20000	00000	99999	Watts
H1-25	Heater Cooldown Time (Heater)	HCT	00002	00002	00000	99999	Second
H2-1	Temperature Setpoint (Purge Heater)	PGS	00180*	00150	00074	00375	Degree
H2-2	Anticipator Gain (Purge Heater)	AS2	00200	00200	00000	99999	Number
H2-3	Cycle Frequency (Purge Heater)	CF2	00010	00010	00000	99999	Degree
H2-4	Rate of Correction Upward (Purge Heater)	RU2	00020	00020	00000	99999	Percent
H2-5	Rate of Correction Downward (Purge Heater)	RD2	00004	00004	00000	99999	Percent

H2-6	No Change High (Purge Heater)	CH2	00005	00005	00000	99999	1/10th Degree
H2-7	No Change Low (Purge Heater)	CL2	00010	00010	00000	99999	1/10th Degree
H2-8	Percent Reduction (Purge Heater)	PR2	00002	00002	00000	99999	Percent
H2-9	Update Timer (Purge Heater)	UT2	00010	00010	00000	99999	Second
H2-10	Over-Temp Alarm (Purge Heater)	OT2	15009	15009	00000	99999	Sec/Deg
H2-11	No Heat Alarm (Purge Heater)	NH2	00180	00180	00000	99999	Second
H2-12	Fixed Output (Purge Heater)	FO2	00000	00000	00000	99999	Percent
H2-13	Dry Purge Delay	DPD	02020	02020	00000	99999	Sec/Sec
H2-14	Purge and Shutdown	PST	00020	00020	00000	99999	Minutes
H2-15	Heater Wattage (Purge Heater)	H2W	01250	01250	00000	99999	Watts

Load Cell:

L1	Load Cell Stable Weight	KDF	00500	00500	00000	99999	Number
L2	Load Cell Stable Time	LST	00100	00100	00000	99999	Millisec
L3	Load Cell Zero	LCZ	01000	01000	00000	99999	Number
L4	Weight Settle Time	WST	01005	01005	00003	99999	Second
L5	Load Cell 1 Zero Limit	LZ1	00000	00000	00000	99999	Number
L6	Load Cell 2 Zero Limit	LZ2	00000	00000	00000	99999	Number

Vacuum:

V1	Vacuum Time Setting	VTS	05020	05020	00001	99999	Minute
V2	Vacuum Pressure Low	VPL	00080	00080	00000	99999	Number
V3	Vacuum Pressure Delta	VPD	05020	05020	00000	99999	Sec/mmHg
V4	Vacuum Shutdown Offset	VSO	00060	00060	00000	99999	Second
V5	Low Vacuum Timeout	LVT	00150	00150	00000	99999	Second
V6	No Vacuum Timeout	NVT	03045	03045	00000	99999	Cnt/Sec
V7	Chamber Purge Timer	VPT	00010	00010	00000	99999	Second
V8	Chamber Purge Interval	VPI	85300	85300	00000	99999	Sec/Sec
V9	Atmospheric Pressure	ATM	00764*	00760	00000	00999	mmHg

System:

S1	Event Logging Time	ELT	00010*	00060	00001	99999	Second
S2	Energy Usage Setting	EUS	20030	20030	00001	99999	Minute

Alarm Flags:

Material Shortage Alarm	Warn
Material Ready	Off
Material Temp	Off
HH Level Alarm	Off
Residence	Off
Throughput Alarm	On
Dump Retry	On
Preheat Completed	Off

Display Flags:

Auto Shutdown	Off
Batch Mode	Off
Cycle Info	On
Display	Throughput
Dispense Time	Off
I/O Status	Off
Residence Time	Off
Display Watchdog	Off
Vacuum Time	Off
Pressure Reference	Absolute

Heat Settings:

Temperature Unit	Fahrenheit
Preheat Mode	Timed
Preheat Setpoint	Same As Run Temp.
Energy Saver	Lim
Ramp	Off
Purge Temp.	Auto

Misc. Settings:

Weight Unit	Pounds
Vacuum Pressure Unit	mm Hg
Auto-Fill Adjust	Off
HH Level Sensor	Off
Loader 1	Off
Loader 2	Off
Purge Chamber	On

Admin. Settings:

Blower	VFD
T4	Off
T5	Off

LOAD CELL CALIBRATION

NAME	ZERO	DELTA	CTS/GM	FULL	LAST CALIBRATED
RH LC: 1086331	2399995		21.2	250.0	05/24/21 09:24AM
VC LC: 1658280	1670656		14.7	250.0	05/18/21 02:01PM

Hour Meter	3.8
Maintenance Hour Meter:	3.8 (last reset: never reset)

Alarms and Events

Alarm and Event Log



Alarm and Event Log displays a history of alarms currently active alarms and other events with a date and time stamps and description. Press the upper or lower half of the event display windows to page up or page down. Alarms can be silenced from this screen. Other options in this screen include: Print to USB and Clear the Alarm Log. To print the Alarm and Events Log a USB Flash Drive must be plugged into the ULTRA dryer.

Files will be created on the flash drive in the root of the drive.

ULTRA_ALARM.LOG - Alarm Log

ULTRA_EVENT.LOG - Event Log

Interpreting the Event Log

The following is a description of the columns of information in a log.

Column	Description
1	date and time
2	mode of the dryer operation
3	heating hopper inlet air temperature setpoint
4	actual heating Hopper temperature
5	heater duty cycle (%)
6	heating hopper air outlet temperature
7	material exit temperature (optional RTD)
8	vacuum cycle elapsed time and set time
9	vacuum chamber pressure
10	vacuum chamber material weight
11	retention hopper material weight
12	dryer throughput
13	totalizer reading

Event Log - Example

ULTRA Event Log
Printed 05/24/21 10:01AM

Model: ULTRA-600
HMI Core: 4357 (Touchscreen)
HMI Firmware: U0514A
I/O Firmware: U0514A
HMI Bootloader: 2.26
I/O Bootloader: 1.03
Serial#: 000000-00

05/24/21 09:43:55AM : *** Dryer Started ***
05/24/21 09:43:55AM : *** Dry Purge Supply Valve: ON ***
05/24/21 09:43:55AM : *** Blower Started ***
05/24/21 09:43:57AM : *** Blower Status: STARTED ***
05/24/21 09:43:57AM : *** Heating Hopper Heater Started ***
05/24/21 09:43:58AM : *** Heater Contactor: HIGH ***
05/24/21 09:44:08AM : MODE: HEAT | T1s: 180F | T1a: 79.0F | T1(ATS): 79.0F | H1: 6.2 | T2s: 180F | T2a: 79.3F | T2(ATS): 81.5F | H2: 5.5 | T3: 77.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:44:18AM : MODE: HEAT | T1s: 180F | T1a: 95.2F | T1(ATS): 98.6F | H1: 11.2 | T2s: 180F | T2a: 86.2F | T2(ATS): 98.2F | H2: 7.8 | T3: 77.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:44:29AM : MODE: HEAT | T1s: 180F | T1a: 116.1F | T1(ATS): 145.4F | H1: 13.3 | T2s: 180F | T2a: 94.6F | T2(ATS): 110.7F | H2: 9.7 | T3: 78.1F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:44:39AM : MODE: HEAT | T1s: 180F | T1a: 134.1F | T1(ATS): 155.1F | H1: 14.8 | T2s: 180F | T2a: 103.5F | T2(ATS): 116.6F | H2: 11.5 | T3: 78.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:44:49AM : MODE: HEAT | T1s: 180F | T1a: 146.1F | T1(ATS): 163.0F | H1: 15.9 | T2s: 180F | T2a: 111.2F | T2(ATS): 127.6F | H2: 12.9 | T3: 78.4F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:44:59AM : MODE: HEAT | T1s: 180F | T1a: 153.7F | T1(ATS): 163.6F | H1: 16.9 | T2s: 180F | T2a: 120.2F | T2(ATS): 133.9F | H2: 14.2 | T3: 78.4F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:45:09AM : MODE: HEAT | T1s: 180F | T1a: 160.3F | T1(ATS): 166.8F | H1: 17.7 | T2s: 180F | T2a: 128.3F | T2(ATS): 143.1F | H2: 15.2 | T3: 78.6F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:45:19AM : MODE: HEAT | T1s: 180F | T1a: 165.2F | T1(ATS): 172.2F | H1: 18.1 | T2s: 180F | T2a: 134.8F | T2(ATS): 145.9F | H2: 16.2 | T3: 78.6F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:45:30AM : MODE: HEAT | T1s: 180F | T1a: 169.5F | T1(ATS): 174.0F | H1: 18.5 | T2s: 180F | T2a: 141.8F | T2(ATS): 154.4F | H2: 16.9 | T3: 78.8F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:45:40AM : MODE: HEAT | T1s: 180F | T1a: 173.3F | T1(ATS): 176.9F | H1: 18.7 | T2s: 180F | T2a: 147.2F | T2(ATS): 157.1F | H2: 17.5 | T3: 78.8F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:45:50AM : MODE: HEAT | T1s: 180F | T1a: 175.5F | T1(ATS): 178.9F | H1: 18.7 | T2s: 180F | T2a: 153.5F | T2(ATS): 164.5F | H2: 18.0 | T3: 78.8F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:46:00AM : MODE: HEAT | T1s: 180F | T1a: 177.1F | T1(ATS): 179.2F | H1: 18.8 | T2s: 180F | T2a: 159.6F | T2(ATS): 167.9F | H2: 18.3 | T3: 79.0F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:46:10AM : MODE: HEAT | T1s: 180F | T1a: 178.5F | T1(ATS): 179.4F | H1: 18.8 | T2s: 180F | T2a: 164.7F | T2(ATS): 175.5F | H2: 18.4 | T3: 79.0F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:46:20AM : MODE: HEAT | T1s: 180F | T1a: 179.6F | T1(ATS): 181.0F | H1: 18.7 | T2s: 180F | T2a: 168.4F | T2(ATS): 174.7F | H2: 18.6 | T3: 79.0F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:46:30AM : MODE: HEAT | T1s: 180F | T1a: 180.1F | T1(ATS): 181.2F | H1: 18.6 | T2s: 180F | T2a: 172.0F | T2(ATS): 178.7F | H2: 18.6 | T3: 79.0F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:46:41AM : MODE: HEAT | T1s: 180F | T1a: 180.3F | T1(ATS): 180.5F | H1: 18.6 | T2s: 180F | T2a: 175.3F | T2(ATS): 180.5F | H2: 18.5 | T3: 79.2F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:46:51AM : MODE: HEAT | T1s: 180F | T1a: 180.9F | T1(ATS): 181.0F | H1: 18.5 | T2s: 180F | T2a: 178.0F | T2(ATS): 182.1F | H2: 18.2 | T3: 79.2F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:47:01AM : MODE: HEAT | T1s: 180F | T1a: 181.4F | T1(ATS): 182.1F | H1: 18.3 | T2s: 180F | T2a: 180.0F | T2(ATS): 184.1F | H2: 17.6 | T3: 79.2F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:47:11AM : MODE: HEAT | T1s: 180F | T1a: 181.6F | T1(ATS): 181.8F | H1: 18.2 | T2s: 180F | T2a: 181.9F | T2(ATS): 185.5F | H2: 16.8 | T3: 79.2F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:47:21AM : MODE: HEAT | T1s: 180F | T1a: 181.0F | T1(ATS): 181.4F | H1: 18.1 | T2s: 180F | T2a: 182.7F | T2(ATS): 184.8F | H2: 16.1 | T3: 79.2F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:47:31AM : MODE: HEAT | T1s: 180F | T1a: 180.9F | T1(ATS): 180.1F | H1: 18.0 | T2s: 180F | T2a: 182.1F | T2(ATS): 182.3F | H2: 15.8 | T3: 79.2F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:47:42AM : MODE: HEAT | T1s: 180F | T1a: 181.0F | T1(ATS): 181.0F | H1: 17.9 | T2s: 180F | T2a: 181.0F | T2(ATS): 180.3F | H2: 15.7 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:47:52AM : MODE: HEAT | T1s: 180F | T1a: 181.0F | T1(ATS): 181.2F | H1: 17.8 | T2s: 180F | T2a: 181.2F | T2(ATS): 179.1F | H2: 15.7 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:48:02AM : MODE: HEAT | T1s: 180F | T1a: 180.7F | T1(ATS): 180.9F | H1: 17.8 | T2s: 180F | T2a: 182.8F | T2(ATS): 184.5F | H2: 15.1 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:48:12AM : MODE: HEAT | T1s: 180F | T1a: 180.7F | T1(ATS): 180.3F | H1: 17.7 | T2s: 180F | T2a: 183.0F | T2(ATS): 185.4F | H2: 14.3 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:48:22AM : MODE: HEAT | T1s: 180F | T1a: 180.7F | T1(ATS): 180.5F | H1: 17.7 | T2s: 180F | T2a: 182.1F | T2(ATS): 181.6F | H2: 14.1 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:48:32AM : MODE: HEAT | T1s: 180F | T1a: 180.7F | T1(ATS): 180.7F | H1: 17.6 | T2s: 180F | T2a: 181.4F | T2(ATS): 180.1F | H2: 14.0 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:48:43AM : MODE: HEAT | T1s: 180F | T1a: 180.5F | T1(ATS): 180.5F | H1: 17.6 | T2s: 180F | T2a: 180.3F | T2(ATS): 179.1F | H2: 14.1 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:48:53AM : MODE: HEAT | T1s: 180F | T1a: 181.2F | T1(ATS): 180.7F | H1: 17.5 | T2s: 180F | T2a: 180.5F | T2(ATS): 179.1F | H2: 14.1 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:49:03AM : MODE: HEAT | T1s: 180F | T1a: 180.9F | T1(ATS): 182.1F | H1: 17.4 | T2s: 180F | T2a: 181.2F | T2(ATS): 182.1F | H2: 13.8 | T3: 79.3F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:49:13AM : MODE: HEAT | T1s: 180F | T1a: 180.5F | T1(ATS): 180.3F | H1: 17.3 | T2s: 180F | T2a: 181.6F | T2(ATS): 182.3F | H2: 13.4 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:49:23AM : MODE: HEAT | T1s: 180F | T1a: 180.3F | T1(ATS): 179.8F | H1: 17.3 | T2s: 180F | T2a: 181.2F | T2(ATS): 181.8F | H2: 13.1 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:49:33AM : MODE: HEAT | T1s: 180F | T1a: 180.9F | T1(ATS): 180.3F | H1: 17.3 | T2s: 180F | T2a: 181.0F | T2(ATS): 180.5F | H2: 13.1 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:49:44AM : MODE: HEAT | T1s: 180F | T1a: 181.0F | T1(ATS): 181.8F | H1: 17.2 | T2s: 180F | T2a: 180.9F | T2(ATS): 180.7F | H2: 13.0 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:49:54AM : MODE: HEAT | T1s: 180F | T1a: 181.4F | T1(ATS): 181.4F | H1: 17.1 | T2s: 180F | T2a: 180.3F | T2(ATS): 180.0F | H2: 12.9 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:50:04AM : MODE: HEAT | T1s: 180F | T1a: 181.2F | T1(ATS): 181.8F | H1: 16.9 | T2s: 180F | T2a: 180.0F | T2(ATS): 179.1F | H2: 12.9 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:50:14AM : MODE: HEAT | T1s: 180F | T1a: 180.3F | T1(ATS): 180.5F | H1: 16.9 | T2s: 180F | T2a: 180.1F | T2(ATS): 179.6F | H2: 12.9 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:50:24AM : MODE: HEAT | T1s: 180F | T1a: 180.0F | T1(ATS): 179.2F | H1: 16.9 | T2s: 180F | T2a: 180.1F | T2(ATS): 180.7F | H2: 12.8 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:50:34AM : MODE: HEAT | T1s: 180F | T1a: 180.0F | T1(ATS): 179.4F | H1: 16.9 | T2s: 180F | T2a: 180.1F | T2(ATS): 180.1F | H2: 12.8 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0

05/24/21 09:50:45AM : MODE: HEAT | T1s: 180F | T1a: 179.8F | T1(ATS): 180.1F | H1: 16.9 | T2s: 180F | T2a: 180.7F | T2(ATS): 180.5F | H2: 12.7 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:50:55AM : MODE: HEAT | T1s: 180F | T1a: 179.4F | T1(ATS): 179.4F | H1: 16.9 | T2s: 180F | T2a: 180.9F | T2(ATS): 181.9F | H2: 12.5 | T3: 79.5F | VT: 00:00/20:00 | ABS: 762mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:51:05AM : MODE: HEAT | T1s: 180F | T1a: 179.2F | T1(ATS): 179.2F | H1: 17.0 | T2s: 180F | T2a: 181.2F | T2(ATS): 181.4F | H2: 12.3 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:51:15AM : MODE: HEAT | T1s: 180F | T1a: 179.8F | T1(ATS): 180.3F | H1: 16.9 | T2s: 180F | T2a: 181.2F | T2(ATS): 181.9F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:51:25AM : MODE: HEAT | T1s: 180F | T1a: 180.1F | T1(ATS): 181.0F | H1: 16.9 | T2s: 180F | T2a: 180.5F | T2(ATS): 180.9F | H2: 11.8 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:51:35AM : MODE: HEAT | T1s: 180F | T1a: 180.3F | T1(ATS): 180.3F | H1: 16.8 | T2s: 180F | T2a: 178.9F | T2(ATS): 178.5F | H2: 11.9 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:51:46AM : MODE: HEAT | T1s: 180F | T1a: 180.0F | T1(ATS): 179.6F | H1: 16.8 | T2s: 180F | T2a: 178.5F | T2(ATS): 175.5F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:51:56AM : MODE: HEAT | T1s: 180F | T1a: 180.0F | T1(ATS): 179.8F | H1: 16.8 | T2s: 180F | T2a: 179.1F | T2(ATS): 178.5F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:52:06AM : MODE: HEAT | T1s: 180F | T1a: 180.3F | T1(ATS): 180.7F | H1: 16.8 | T2s: 180F | T2a: 179.4F | T2(ATS): 180.0F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:52:16AM : MODE: HEAT | T1s: 180F | T1a: 180.3F | T1(ATS): 180.7F | H1: 16.7 | T2s: 180F | T2a: 179.6F | T2(ATS): 180.1F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:52:26AM : MODE: HEAT | T1s: 180F | T1a: 180.5F | T1(ATS): 180.7F | H1: 16.6 | T2s: 180F | T2a: 179.8F | T2(ATS): 180.3F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:52:36AM : MODE: HEAT | T1s: 180F | T1a: 180.0F | T1(ATS): 179.4F | H1: 16.6 | T2s: 180F | T2a: 180.0F | T2(ATS): 180.0F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:52:46AM : MODE: HEAT | T1s: 180F | T1a: 179.6F | T1(ATS): 178.7F | H1: 16.7 | T2s: 180F | T2a: 180.1F | T2(ATS): 180.3F | H2: 12.0 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:52:57AM : MODE: HEAT | T1s: 180F | T1a: 180.0F | T1(ATS): 180.1F | H1: 16.7 | T2s: 180F | T2a: 180.3F | T2(ATS): 180.7F | H2: 11.9 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:53:07AM : MODE: HEAT | T1s: 180F | T1a: 180.5F | T1(ATS): 181.4F | H1: 16.6 | T2s: 180F | T2a: 180.1F | T2(ATS): 180.5F | H2: 11.8 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:53:17AM : MODE: HEAT | T1s: 180F | T1a: 180.9F | T1(ATS): 181.2F | H1: 16.5 | T2s: 180F | T2a: 180.5F | T2(ATS): 181.0F | H2: 11.7 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:53:27AM : MODE: HEAT | T1s: 180F | T1a: 180.5F | T1(ATS): 180.1F | H1: 16.5 | T2s: 180F | T2a: 180.5F | T2(ATS): 180.9F | H2: 11.5 | T3: 79.7F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:53:37AM : MODE: HEAT | T1s: 180F | T1a: 180.1F | T1(ATS): 179.4F | H1: 16.5 | T2s: 180F | T2a: 180.7F | T2(ATS): 181.2F | H2: 11.4 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:53:47AM : MODE: HEAT | T1s: 180F | T1a: 180.1F | T1(ATS): 180.1F | H1: 16.5 | T2s: 180F | T2a: 180.7F | T2(ATS): 180.7F | H2: 11.2 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:53:58AM : MODE: HEAT | T1s: 180F | T1a: 180.1F | T1(ATS): 180.3F | H1: 16.5 | T2s: 180F | T2a: 180.7F | T2(ATS): 180.5F | H2: 11.2 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:54:08AM : MODE: HEAT | T1s: 180F | T1a: 179.6F | T1(ATS): 179.1F | H1: 16.5 | T2s: 180F | T2a: 179.4F | T2(ATS): 177.4F | H2: 11.2 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:54:18AM : MODE: HEAT | T1s: 180F | T1a: 179.4F | T1(ATS): 179.1F | H1: 16.5 | T2s: 180F | T2a: 179.2F | T2(ATS): 178.3F | H2: 11.3 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:54:28AM : MODE: HEAT | T1s: 180F | T1a: 179.6F | T1(ATS): 179.6F | H1: 16.5 | T2s: 180F | T2a: 178.9F | T2(ATS): 178.2F | H2: 11.3 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:54:38AM : MODE: HEAT | T1s: 180F | T1a: 180.1F | T1(ATS): 180.5F | H1: 16.4 | T2s: 180F | T2a: 179.1F | T2(ATS): 179.2F | H2: 11.3 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:54:47AM : *** Heating Hopper Heater Stopped ***
05/24/21 09:54:47AM : *** Blower Stopped ***
05/24/21 09:54:48AM : MODE: FILL | T1s: 180F | T1a: 180.3F | T1(ATS): 181.0F | H1: 0.0 | T2s: 180F | T2a: 179.6F | T2(ATS): 181.0F | H2: 11.1 | T3: 79.9F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 0 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:54:54AM : *** Blower Status: STOPPED ***
05/24/21 09:54:54AM : *** Heater Contactor: LOW ***
05/24/21 09:55:04AM : *** Upper Vacuum Gate: OPENED ***
05/24/21 09:55:08AM : *** Vacuum Chamber Fill Valve: OPENED ***
05/24/21 09:55:13AM : *** Vacuum Chamber Fill Valve: CLOSED ***
05/24/21 09:55:23AM : Fill Time: 4.484 | Fill Rate: 8041 g/s | VC: 79.2
05/24/21 09:55:23AM : *** Fill Retry ***
05/24/21 09:55:23AM : *** Vacuum Chamber Fill Valve: OPENED ***
05/24/21 09:55:27AM : *** Vacuum Chamber Fill Valve: CLOSED ***
05/24/21 09:55:37AM : Fill Time: 4.391 | Fill Rate: 8041 g/s | VC: 157.0
05/24/21 09:55:37AM : Final Fill Weight: 157.1 / 150.0 | Retries: 1
05/24/21 09:55:37AM : *** Upper Vacuum Gate: CLOSED ***
05/24/21 09:55:37AM : *** Blower Started ***
05/24/21 09:55:40AM : *** Blower Status: STARTED ***
05/24/21 09:55:40AM : *** Heating Hopper Heater Started ***
05/24/21 09:55:40AM : MODE: FILL | T1s: 180F | T1a: 154.4F | T1(ATS): 154.4F | H1: 1.5 | T2s: 180F | T2a: 179.8F | T2(ATS): 179.6F | H2: 11.1 | T3: 79.5F | VT: 00:00/20:00 | ABS: 764mmHg | VC: 157 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:55:41AM : *** Heater Contactor: HIGH ***
05/24/21 09:55:45AM : *** Vacuum Generator Supply Valve: OPENED ***
05/24/21 09:55:45AM : *** Vacuum Generator Check Valve: OPENED ***
05/24/21 09:55:50AM : MODE: HT/VAC | T1s: 180F | T1a: 140.2F | T1(ATS): 119.1F | H1: 5.3 | T2s: 180F | T2a: 179.8F | T2(ATS): 179.8F | H2: 11.1 | T3: 79.5F | VT: 00:00/20:00 | ABS: 588mmHg | VC: 157 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:56:01AM : MODE: HT/VAC | T1s: 180F | T1a: 127.2F | T1(ATS): 108.0F | H1: 9.7 | T2s: 180F | T2a: 180.3F | T2(ATS): 180.3F | H2: 11.0 | T3: 79.5F | VT: 00:00/20:00 | ABS: 382mmHg | VC: 157 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:56:11AM : MODE: HT/VAC | T1s: 180F | T1a: 131.4F | T1(ATS): 137.1F | H1: 12.3 | T2s: 180F | T2a: 181.6F | T2(ATS): 183.9F | H2: 10.4 | T3: 79.3F | VT: 00:00/20:00 | ABS: 277mmHg | VC: 157 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:56:21AM : MODE: HT/VAC | T1s: 180F | T1a: 142.7F | T1(ATS): 156.4F | H1: 13.8 | T2s: 180F | T2a: 181.8F | T2(ATS): 183.0F | H2: 10.0 | T3: 79.3F | VT: 00:00/20:00 | ABS: 208mmHg | VC: 157 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:56:31AM : MODE: HT/VAC | T1s: 180F | T1a: 151.2F | T1(ATS): 166.1F | H1: 14.6 | T2s: 180F | T2a: 180.5F | T2(ATS): 179.2F | H2: 10.0 | T3: 79.3F | VT: 00:00/20:00 | ABS: 153mmHg | VC: 157 | RH: 0 | TPT: --- | TOT: 0
05/24/21 09:56:41AM : MODE: HT/VAC | T1s: 180F | T1a: 158.2F | T1(ATS): 166.6F | H1: 15.4 | T2s: 180F | T2a: 180.0F | T2(ATS): 178.5F | H2: 10.1 | T3: 79.3F | VT: 00:00/20:00 | ABS: 120mmHg | VC: 157 | RH: 0 | TPT: --- | TOT: 0

Alarms – Causes and Solutions



Typically, problems are indicated by an alarm condition on the Dryer controller's display with an audible alarm and a flashing strobe light. The following alarm troubleshooting chart will describe the alarm condition and possible causes and solutions.

Alarm Display:	Troubleshooting:
ALARM:01 <u>Screen: Blower Failure</u> Log: BLOWER FAILURE	Problem: The blower is not running. Motor contactor overload relay has tripped. See wiring diagrams in the back of this manual. Item # 3, overload relay on wiring diagram. This alarm will trigger a dryer shutdown. Solution: Reset contactor. Check that blower motor shaft is not locked. Check line voltage to machine; make sure voltage is not too low which can cause an increase in amperage. Check that power source has not lost a phase.
ALARM:02 <u>Screen: Heat Hopper No Heat</u> Log: NO HEAT	Problem: No heat or inadequate heat detected by the heating hopper inlet RTD. This alarm is triggered by the NH1 parameter. The NH1 parameter is the maximum time limit, in seconds, after the heat cycle begins, during which one of the following two conditions must be detected: Either the temperature must climb 20 degrees, or the temperature must move at least 20 percent toward the target temperature. If neither condition is met the "NO HEAT" alarm will sound. Such an occurrence would signal a failure of either the heater or the airflow from the blower. This parameter and consequent alarm protects the heater from burn-out in the event the blower fails or airflow is blocked. Solution: Check for airflow from the blower. Check for a blower inlet obstruction, check that 2" air duct from blower to heater is not detached, obstructed or perforated. Check 2" air duct from top of heater to heating hopper inlet for detachment, obstruction or perforation. Check continuity across heater leads. See wiring diagram in the back of this manual.
ALARM:03 <u>Screen: Heater Setpoint Exceeded</u> Log: SETPOINT EXCEEDED	Problem: The heating hopper air inlet temperature has drifted above set-point. If the Heating hopper air inlet temperature (T1a sensor) is over the degrees specified in parameter OT1 (default: 6°F or 6°C) for a time greater than the time in seconds specified in OT1, then the alarm is triggered. The alarm will occur but the machine will keep running. See OT1 parameter for more information. Solution: No solution is necessary under normal circumstances as the dryer is alerting to a temperature adjustment. If this alarm continued to repeat, contact Maguire Technical Support.
ALARM:04 <u>Screen: Heater Runaway</u> Log: RUNAWAY	Problem: The heating hopper air inlet temperature has exceeded set-point by an excessive amount. If the Heating hopper air inlet temperature (T1a sensor) goes 20°F (11°C) over set-point, and alarm is triggered and a system shutdown occurs. Solution: Contact Maguire Technical Support

ALARM:05 <u>Screen: Purge Heater No Heat</u> Log: PURGE HTR NO HEAT	Problem: No heat or inadequate heat detected by the purge heater RTD. This alarm is triggered by the NH2 parameter. The NH2 parameter is the maximum time limit, in seconds, after the heat cycle begins, during which one of the following two conditions must be detected: Either the temperature must climb 20 degrees, or the temperature must move at least 20 percent toward the target temperature. If neither condition is met the "NO HEAT" alarm will sound. Such an occurrence would signal a failure of either the purge heater or the compressed airflow. This parameter and consequent alarm protects the purge heater from burn-out if compressed airflow is blocked. Solution: Check compressed airflow to the purge heater. Check continuity across the purge heater leads. See wiring diagram in the back of this manual.
ALARM:06 <u>Screen: Purge Heater Setpoint Exceeded</u> Log: PURGE SP EXCEEDED	Problem: The purge/blanketing air temperature has drifted above set-point. If the purge/blanketing air temperature (T2a sensor) is over the degrees specified in parameter OT2 (default: 6°F or 6°C) for a time greater than the time in seconds specified in OT2, then this alarm is triggered. The alarm will occur, but the machine will keep running. See OT2 parameter for more information. Solution: No solution is necessary under normal circumstances as the dryer is alerting to a temperature adjustment. If this alarm continued to repeat, contact Maguire Technical Support.
ALARM:07 <u>Screen: Purge Heater Runaway</u> Log: PURGE HTR RUNAWAY	Problem: The purge/blanketing air temperature has exceeded set-point by an excessive amount. If the purge/blanketing air temperature (T2a sensor) goes 20°F (11°C) over set-point and remains there for 5 continuous seconds, and alarm is triggered, and a system shutdown occurs. Solution: Contact Maguire Technical Support
ALARM:08 <u>Screen: No Vacuum</u> Log: NO VACUUM	Problem: The dryer failed to pull a vacuum after three attempts. The dryer was unable to achieve a vacuum 200mm below atmosphere within 45 seconds (default). Dryer attempted three times (number of default retries). After each attempt vacuum was equalized and vacuum gates were opened and closed in an attempt to reseal the Vacuum Chamber (possible debris or pellets preventing adequate seal). Defaults are controlled the NVT parameter (retries and seconds). This alarm is non-fatal. Dryer will continue to reseal after alarming. Solution: If Dryer continues to alarm, check: compressed air connection and pressure (dryer's regulator should be reading 85psi). Check for debris in seals above and below Vacuum Chamber.
ALARM:09 <u>Screen: Final Dispense</u> Log: FINAL DISPENSE	Problem: Alert: Process will soon be starved of material. If the Final Dispense alarm is enabled under the "Alarm Setup" menu, an alarm will sound after the final vacuum chamber dispense of a given run cycle completes. This is to alert the operator that the process will soon be starved of material.

ALARM:11 <u>Screen: RTD Failure</u> Log: RTD FAILURE	Problem: RTD (temperature sensor) reading is above or below max/min reading RTD Sensor is probably disconnected or damaged. Check temperature display reading in a cool state. Temperature should display room temperature. If reading is below -25°C or above 450°C RTD sensor has failed. Solution: Contact Maguire Technical Support for a replacement RTD Sensor.
ALARM:12 <u>Screen: Material Shortage</u> Log: MATERIAL SHORTAGE	Problem: Maximum Fill Time (VFT parameter) has been reached before target material weight (VTH parameter) has been achieved. This alarm is triggered when the VFT parameter has been reached (Vessel Fill Time) before the VCH (Vacuum Chamber High level), indicating shortage of material in heating hopper or possible valve jam. The outcome of this alarm is controlled by the Material Shortage Alarm settings. See page 44. Solution: Check material supply. Check Vacuum Chamber fill valve located at the base of the heating hopper.
ALARM:15 <u>Screen: Low Air Pressure</u> Log: LOW AIR PRESSURE	Problem: Air pressure sensor has detected air pressure below 50 psi. Solution: Check exhausting lockout valve located on the front lower left side of dryer. Ensure that the valve is open. Check pressure of air supply.
ALARM:16 <u>Screen: Heat Hopper Fail-Safe</u> Log: HEATER FAIL-SAFE	Problem: The heating hopper heater temperature safety switch has opened due to an overheat condition. Located on the top of the Heater Tube is a Temperature Safety Switch. If the temperature of the heater exceeds the safety switch maximum, this switch opens, shutting down the dryer. Solution: Allow the dryer to cool. Open the left side panel of the dryer and locate the heating hopper heater safety switch on the side of the stainless-steel heater tube. Press the red button to reset the switch. If the problem occurs repeatedly, contact Maguire Technical Support.
ALARM:17 <u>Screen: Purge Heater Fail-Safe</u> Log: PH FAIL-SAFE	Problem: The purge heater temperature safety switch has opened due to an overheat condition. Located on the top of the purge heater tube is a temperature safety Switch. If the temperature of the purge heater exceeds the safety switch maximum, this switch opens, shutting down the dryer. Solution: Allow the dryer to cool. Remove the purge heater cover located behind the retention hopper. Locate the purge heater safety switch on the top side of the stainless-steel purge heater tube. Press the red button to reset the switch. If the problem occurs repeatedly, contact Maguire Technical Support.

ALARM:18 <u>Screen: Vacuum Chamber Missing</u> Log: VC MISSING	Problem: The Vacuum Chamber is missing. If Vacuum Chamber load cell is reading 4.5 pounds (2000 grams) below tare during AUTO run, this alarm is triggered and Dryer stops (fatal). This alarm is generally caused by a missing Vacuum Chamber but may also be caused by the dryer Vacuum Chamber load cells having been zero calibrated while material was in the Vacuum Chamber. Solution: If Vacuum Chamber is missing replace Vacuum Chamber. If Vacuum Chamber is in place, ensure the chamber is empty and zero calibrate the load cells. If load cells are damaged, a zero calibration may detect this.
ALARM:19 <u>Screen: Retention Hopper Missing</u> Log: RH MISSING	Problem: The Retention Hopper is missing. If Retention Hopper load cell is reading 6.6 pounds (3000 grams) for the ULTRA-150 or 11 pounds (5000 grams) below tare during AUTO run, this alarm is triggered and Dryer stops (fatal). This alarm is generally caused by a missing Retention Hopper but may also be caused by dryer Retention Hopper load cells having been zero calibrated while material was in the Retention Hopper. Solution: If Retention Hopper is missing replace Retention Hopper. If Retention Hopper is in place, ensure the hopper is empty and zero calibrate the load cells. If load cells are damaged, a zero calibration may detect this.
ALARM:20 <u>Screen: Throughput Exceeded</u> Log: THRUPUT EXCEEDED	Problem: The throughput of the dryer has been exceeded. This is an optional alarm (under alarms menu), defaulted to enabled. This alarm is triggered when the Retention Hopper low level has been reached before the vacuum timer has elapsed. This means demand for material has exceeded dried material supplied. This alarm is non-fatal, dryer continues to run. Solution: This is caused by exceeding material demand.
ALARM:21 <u>Screen: Low Vacuum</u> Log: LOW VACUUM	Problem: Dryer failed to pull vacuum down to target vacuum pressure set in VPL parameter. Dryer attempted to pull a vacuum down to target vacuum pressure within 120 seconds (default value in LVT parameter). Possible causes and Solution: If dryer alarms, check: compressed air connection and pressure (dryer's regulator should be reading 85psi). Check for debris in seals above and below Vacuum Chamber. Alarm may also have been caused by a vacuum leak. Contact Maguire technical support if cause is not found.
ALARM:23 <u>Screen: Residence Time</u> Log: RESIDENCE TIME	Problem: Material has been in the retention hopper too long. This alarm is triggered by the RAL parameter. When the Residence Alarm has been enabled, this alarm will sound if not enough material has been removed from the retention hopper in the time specified in the RAL parameter. For more information, see the RAL parameter on page 57. Solution: To prevent this alarm: decrease fill weight, or turn on Fill Weight Adjust (Material Setup menu).
ALARM:24 <u>Screen: Batch Complete</u> Log: BATCH COMPLETE	Batch is complete This alarm triggers at the end of a batch run, the end being defined as the time at which the retention hopper is depleted to the HHL parameter level after the final vacuum chamber dump of said batch run.

ALARM:25 <u>Screen: Material Shutdown</u> Log: MATERIAL SHUTDOWN	Material Shutdown This alarm triggers if the Material Shortage alarm is set to "SHUTDOWN" and is it determined that the heating hopper has been fully depleted of material via the VFA parameter criteria. When this alarm triggers, the ULTRA enters a Shutdown state automatically. This alarm can be useful. For example: at the end of the day, one can intentionally run the heating hopper empty (by turning off its feed loader) and have the ULTRA automatically initiate a shut down at the appropriate time.
ALARM:26 <u>Screen: Material Ready</u> Log: MATERIAL READY	Material Ready If the Material Ready alarm is enabled under the "Alarm Setup" menu, this alarm will trigger after the first and only first batch of material has completed a full vacuum cycle. After 15 seconds, the audible portion of this alarm will automatically silence. The first batch of material will remain under vacuum indefinitely until this alarm is cleared. There are two main purposes of this alarm: 1. To alert the operator that dry material is ready for the process. 2. To act as a hold-back, when necessary, giving the operator additional time to prepare the process.
ALARM:27 <u>Screen: Auto Shutdown</u> Log: AUTO SHUTDOWN	Auto Shutdown This alarm triggers when an Auto Shutdown, that is, a shut down at a pre-determined time, has commenced. "Commencement" is defines as the time at which the final vacuum chamber fill has occurred.
ALARM:28 <u>Screen: Heat Hopper Material Low</u> Log: HH MATERIAL LOW	Heating Hopper Material Low On ULTRA dryers with an optional Heating Hopper Level sensor, this alarm triggers when the "HH Mat. Level" alarm is enabled under the "Alarm Setup" menu and the level in the heating hopper has dropped below the HHA parameter value.
ALARM:29 <u>Screen: Material Temp</u> Log: MATERIAL TEMP	Material Temperature Alarm When the Material Temp alarm is enabled under the "Alarm Setup" menu, during any instance where the Heating Hopper is called upon to dispense material into the vacuum chamber and the T2 (heating hopper exit) temperature is below the ESM parameter level, this alarm will trigger. Its purpose is to alert the operator that insufficient heating has occurred, most likely from a process throughput that exceeds the capacity of the ULTRA.
ALARM:30 <u>Screen: Vacuum Chamber Dump Failure</u> Log: VC DUMP FAILURE	VC Dump Failure When the VC Dump alarm is enabled under the Alarm Setup menu, vacuum chamber dumping is monitored. When is has been determined that the vacuum chamber has failed to dump sufficient material into the retention hopper after a certain amount of retries as defined by the VDR parameter, this alarm will trigger. The vacuum chamber will continue dump attempts indefinitely, until the "successful dump" criteria is satisfied, at which point this alarm will auto-silence.
ALARM:31 <u>Screen: Preheat Complete</u> Log: PREHEAT COMPLETE	Preheat Complete Optional advisory alarm, that when enabled, is triggered at the completion of the preheat cycle

Maintenance



Prior to performing any maintenance procedures and/or cleanout procedures, the ULTRA dryer must be pneumatically and electrically locked out to prevent the risk of serious injury and/or damage to the machine.

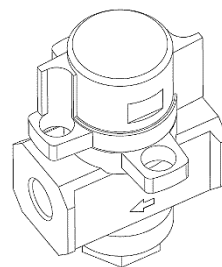
Lockout/Tagout



Prior to performing any maintenance procedures and/or cleanout procedures, the ULTRA dryer must be pneumatically and electrically locked out to prevent the risk of serious injury and/or damage to the machine.

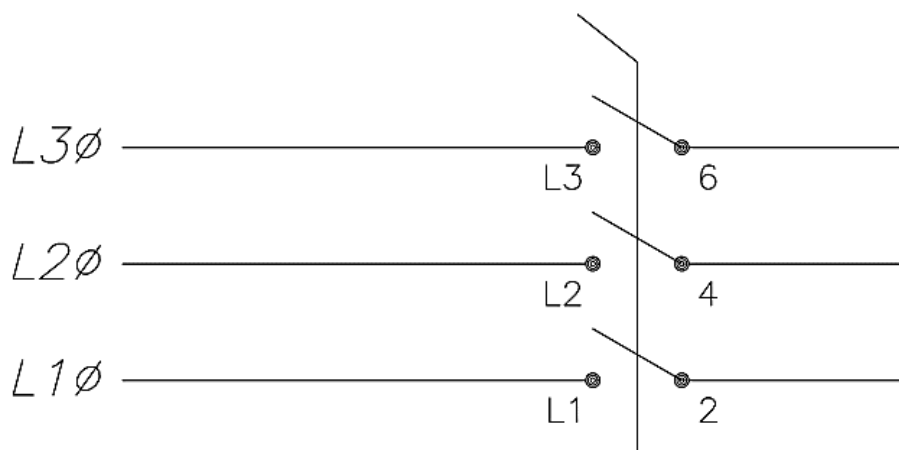
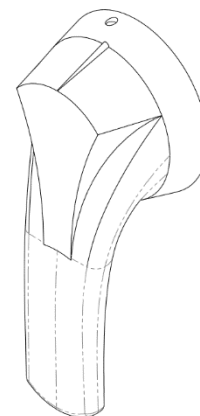
Pneumatic Lockout/Tagout

The lockout/tagout safety device is in the pneumatics bay beneath the electrical cabinet and is attached directly to the air regulator. Turning the red knob will properly cut off the supply air as well as completely dump the residual internal pressure to atmosphere.



Electrical Lockout/Tagout

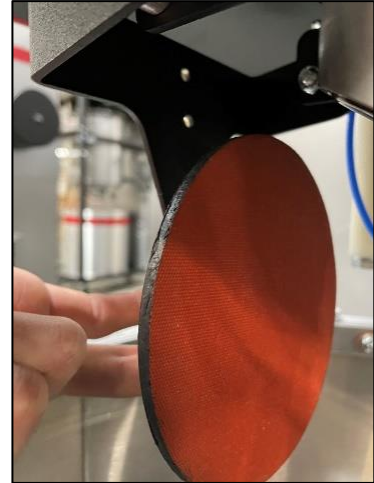
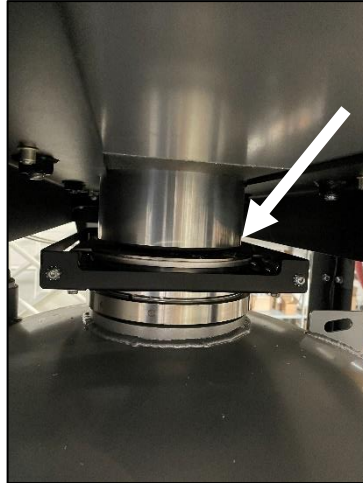
The electrical lockout device is located on the electrical cabinet. This switch will cut off all power to the machine and is designed to safeguard from electrocution in the event of unexpected energization of the machine during maintenance. When shifted into the 'OFF' position, power to the machine is cut off and the controller will not power on. Refer to the ladder diagram below.



Preventative Maintenance

Weekly: It is advised that the following be performed once per week.

Particle Build-Up: Check for build-up of pellet/dust particulate. Depending on the material being processed, particles may accumulate on the upper vacuum gate or the vacuum chamber tank head. It is crucial to keep the upper vacuum gate O-ring free from any debris to ensure a proper vacuum.



Moisture Traps: Depending on the quality of the supply air, moisture and/or oil may build up in the moisture traps of the air regulator. Press button to drain. If equipped with the optional membrane air dryer, there will be an additional moisture trap attached to the mist eliminator.



Do not supply Dryer with a lubricated air supply. Damage to Dryer may occur. Use only a clean, dry, oil-free air supply.

Preventative Maintenance – Cont.

Monthly: It is advised that the following be performed once per month.

Air Supply Filter(s):

Unscrew the drainage trap from the air regulator unit and remove and inspect the filter element. Replace if necessary. If equipped with an optional membrane air dryer, there is an additional filter that should be inspected.



Membrane Air Dryer:

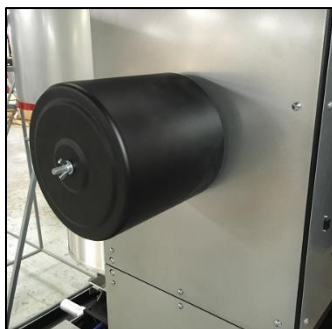
This is an option for Maguire ULTRA dryers. If equipped, monitor the **Color Dew Point Indicator**. When outlet air is moist, the indicator will be YELLOW; when dry, it will be GREEN. If it is YELLOW, a replacement may be needed.



**Dryers received prior to 2019 will show moist as PINK and dry as BLUE*

Inlet Air Filter:

Located on the back side of the machine, the inlet air filter needs to be periodically inspected and cleaned. Remove the air filter housing and inspect the 5 micron filter. Replace if necessary. The purpose of this filter is to remove contaminants from the ambient air.



Preventative Maintenance – Cont.

Bi-Annually: It is advised that the following be performed every 6 months.

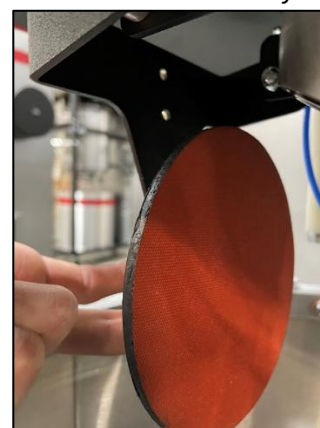
Manual Operations:

Using the touchscreen controller, check the machine functionality within the 'Operate Outputs' menu. Valves and other devices can be manually activated with this feature. This also serves as a built-in troubleshooting tool.



Lower Vacuum Gate:

Ensure that the flapper arm is not bent and that the seal can provide a proper seal for a vacuum. If the machine cannot efficiently pull a vacuum, it will alarm and not allow for the material to dry as intended.



Seals/O-rings:

Check the integrity of all seals and O-rings and clear any debris that may prevent proper seal. Failure to do so could result in material leakage and low vacuum.



On-the-Fly Material Change

1. Tools [password] > Dryer Configuration > Special Features > Material Change (check)



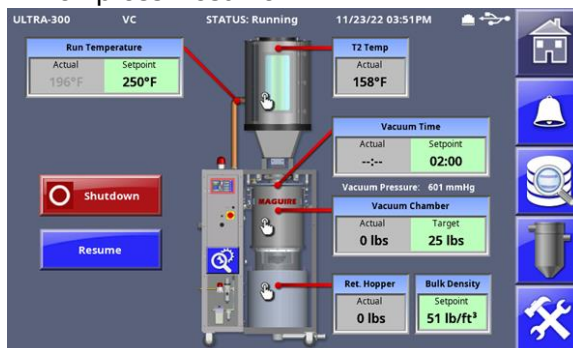
2. When heating hopper material starvation has been detected:



3. Silence ALARM #12, then select "Material Change".



4. Clean the heating hopper. Then press Resume.



5. During the period after the vacuum chamber has been dumped but before the post-material-change Preheat has been completed, ALARM #18 (Vacuum Chamber Missing) is disabled. The vacuum chamber can be removed and cleaned during this time.

Clean Out – Procedure

'Clean Out' dumps the heating hopper or the vacuum chamber or both at the same time. The following explains how to perform these procedures.

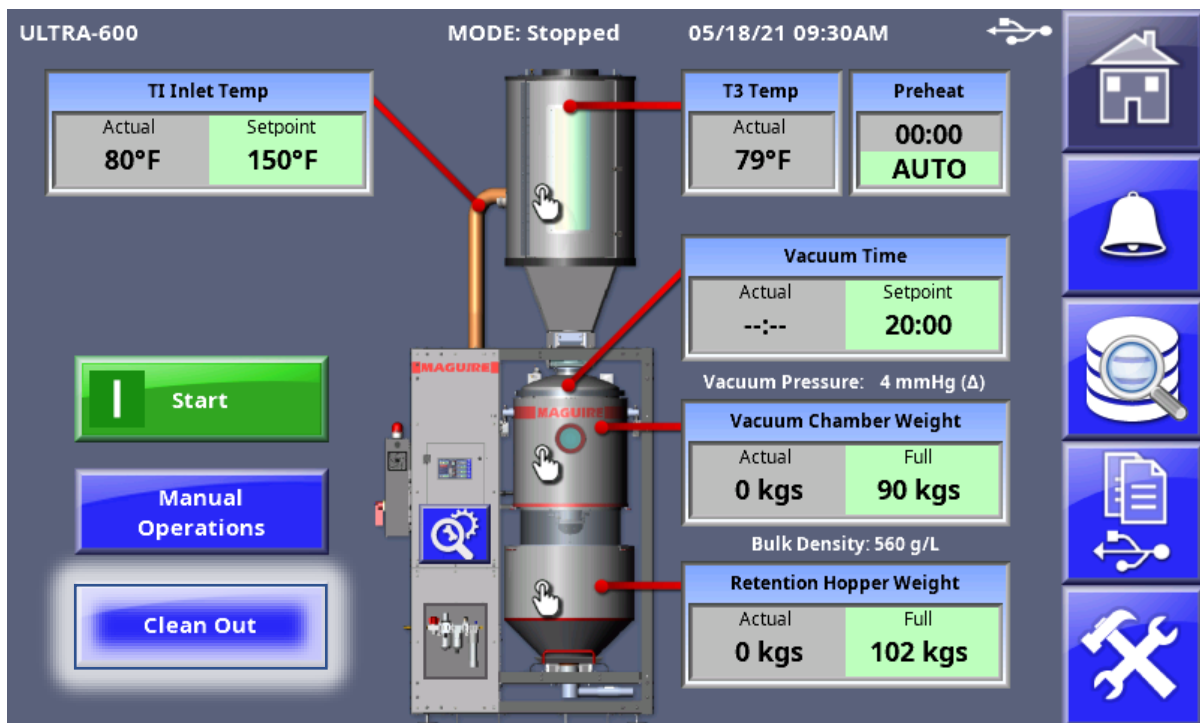


Do Not Perform a Clean Out Unless ULTRA dryer is First Properly Shut Down.

For proper shutdown procedure, see Startup and Operation on page 37.

During the Clean Out, keep hands and tools clear of all valves. **DO NOT** reach into machine during Clean Out.

Clean Out Mode is accessible from the home screen.



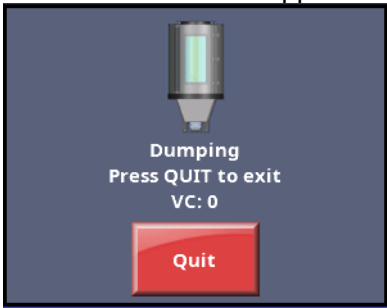
Emptying the Heating Hopper



HEATING HOPPER HOT SURFACES:

As with all dryers, there are **HOT SURFACES** to avoid. Temperatures can reach 350°F, (180°C). Typically, these surfaces are not at dangerous temperatures, however all hot surfaces should be avoided.

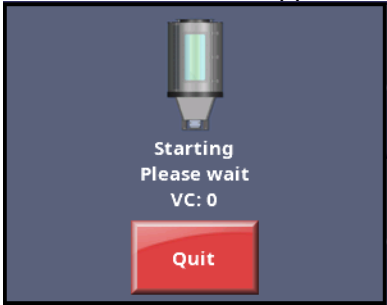


Press		The Clean Out button is located on the Home Screen. Display will show dumping options.
Press		Status window will appear. 
Press		To close the valve and end 'Dump Heating Hopper'.
The Heating Hopper has a front door for access to the full internal height of the Heating Hopper. The Heating Hopper is non-removable. Prior to opening the front access door, removal of all material is recommended. Once the access door is safely opened, it is recommended to either blow out or vacuum any remaining pellets in the event of a material change.		



Emptying the Vacuum Chamber

IMPORTANT: During the Clean Out, keep hands and tools clear of all valves. DO NOT reach into machine during Clean Out.

Press		The Clean Out button is located on the Home Screen. Display will show dumping options. Both the Dump Heating Hopper screen button and the Heating Hopper Drain Valve button (located near the upper rear of the Vacuum Chamber area) can be used to empty the Heating Hopper.
Press		status window will appear. 
Press		to close the valve and end 'Dump Vacuum Chamber'.
The vacuum chamber is designed for ease of clean out. When necessary, the access hatch can be removed, giving full access to the inside of the chamber. Once the access hatch is safely opened, it is recommended to either blow out or vacuum any remaining pellets in the event of a material change.		



Clean Out / Dump All

Dump All opens all valves allowing material to flow freely through the dryer. Material in the Heating Hopper will pass into the Vacuum Chamber and then pass into the Retention Hopper. In this mode, it is possible to empty the entire dryer using a conveying system pulling from the material outlet at the base of the dryer.

Press		The Clean Out button is located on the Home Screen. Display will show: Batch Start Clean Out Mode screen. Both the Dump Heating Hopper screen button and the Heating Hopper Drain Valve button (located near the upper rear of the Vacuum Chamber area) can be used to empty the Heating Hopper.
Press		Confirmation window will appear.
Press		To close the valves and end 'Dump All' mode.

If using this method, it is recommended that a bucket be placed inside the retention hopper to collect the remaining material that resides in the heating hopper and vacuum chamber.

**Lower sealing collar****Lift hopper off load cells****Roll out the retention hopper**

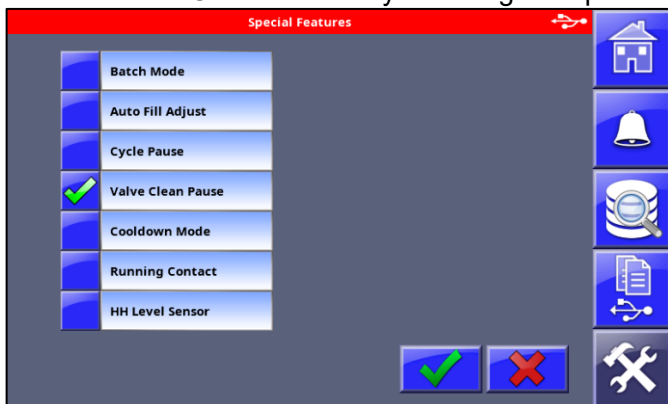
**Remember to re-engage load cells after pushing the retention hopper back into place*

Valve Clean Pause

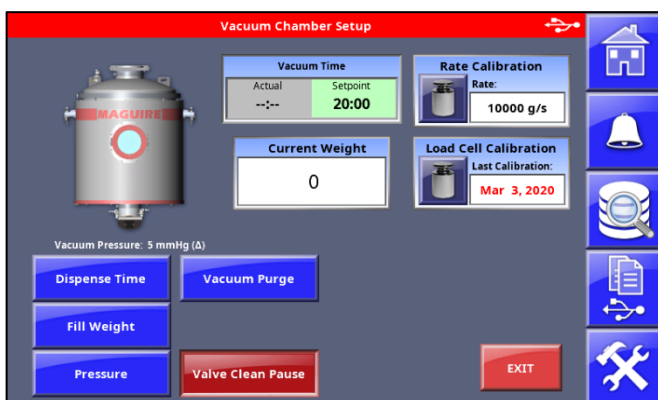
This feature is utilized to clean the upper and/or lower vacuum gates on the fly by keeping them open for any desired time, while pausing operation. By default, this feature is NOT enabled and must be done so in the system configuration screen.

Setup Menu > [PASSWORD] > Dryer Configuration > Special Features > Valve Clean Pause

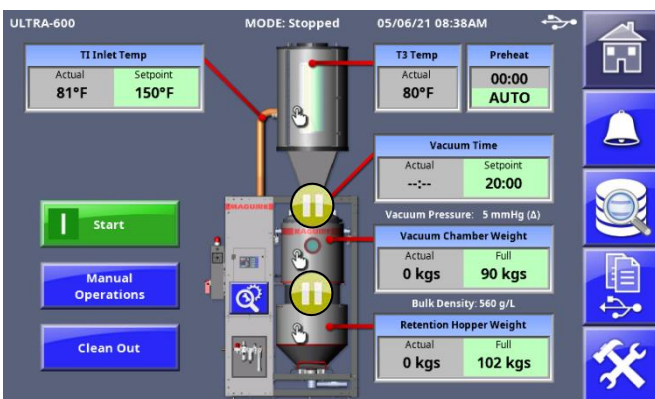
Enable “Valve Clean Pause” by checking the option as shown below:



In order to clean the vacuum gate valves on the fly, press the **vacuum chamber** on the Home screen. The Valve Clean Pause button is now displayed and can be used. Once pressed, the button will turn red once a Pause is queued up.



After the next vacuum chamber dump/fill cycle, both the upper and lower vacuum gates will stay open. Yellow “Pause” icons will now appear on the Home screen. To resume operation, press the vacuum chamber on the home screen and deselect (press) the Valve Clean Pause button.

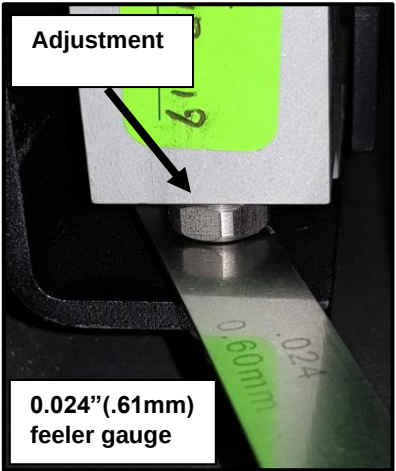


Load Cell Calibration

Load Cell Gapping

Prior to calibrating, check that the load cell gaps are properly set to 0.024" (0.61mm). The load cells are quality inspected, and the gap is set in-house; however, unforeseeable adjustments could occur during shipping. If the gap happens to be incorrect, set the load cell over-travel limit gap between the overtravel bolt and the load cell adjustment screw. It should be set such that the 0.024" feeler gauge passes through while having minimal friction between the two heads of the screws.

Load cells should be unloaded prior to gap-checking; meaning the vacuum chamber will be in the 'down' position and resting on the rails, rather than the load cells



For full weight calibration to be performed on either the ULTRA-600 or ULTRA-1000 dryers, it is required that raw pelletized material be conveyed into the heating hopper prior to beginning the calibration sequence.

With bucket/container placed on a scale, insert raw material. <i>Be sure to tare/zero the scale prior to loading material</i>	Measure 250 lbs (ULTRA-600) Measure 350 lbs (ULTRA-1000)	Using a material lance, or equivalent loading system, load the raw material into the heating hopper.

Once all the material is loaded into the heating hopper, **follow the steps on the next page** to proceed with the full weight calibration procedure. It is important to note that a 'zero-weight' calibration be successfully performed prior to initiating a full-weight calibration on the vacuum chamber or retention hopper.

It is also recommended that a "Return to Zero" test be performed where the material is removed from the chamber being calibrated and it is observed returning to zero.

If material totals are being observed, full weigh calibration is recommended periodically (approximately every six months).

Press		Display will require user to input password. (default: 22222). Then Press ✓
Press		Display will show the Dryer Configuration categories.
Press		Display will show the Load-Cell Setup screen.
Press	Vacuum Chamber Zero/Full Calibration 	Display will show the ZERO / FULL Calibration screen.
Press		Display will say: Confirm Vacuum Chamber is empty then press ZERO. Weight of 0 follows successful calibration.
Press		This will prompt the vacuum chamber fill valve to open and dump the material from the heating hopper to the vacuum chamber.
Press		When all the material has been dumped into the vacuum chamber, this will manually close the valves and allow full weight calibration to commence.
Press		Screen will display a keypad. Enter the known weight and then press ENTER. *
Press		Returns user back to the Load Cell Setup menu. The 'Last Calibrated On' date should now be updated.
Press	Retention Hopper Zero/Full Calibration 	Display will show the ZERO / FULL Calibration screen.
Press		Display will say: Confirm Retention Hopper is empty then press ZERO. Weight of 0 follows successful calibration.
Press		This will prompt the vacuum chamber to dump the material into the retention hopper.
Press		When all the material has been dumped into the retention hopper, this will manually close the valves and allow full weight calibration to commence.
Press		Screen will display a keypad. Enter the known weight and then press ENTER. *
Press		Returns to the Load Cell Setup menu. The 'Last Calibrated On' date should now be updated.
Press		To exit Zero / Full Weight Calibration screen. Repeat procedure for Retention Hopper.

* If the display reads "BAD CELL," the weight entered is incorrect, the chamber is not free to move, or the load cells are faulty.

Level Sensor Calibration

Once the optional heating hopper level sensor is securely mounted and connected, it needs to be calibrated prior to machine operation. These instructions assume that an out-of-the-box sensor in its original factory configuration is being configured.

1. Units Selection:

- 1a. Press "mode/enter". Display will show "Uni."
- 1b. Press "set". Display will show "cm".
- 1c. Press-and-hold "set" until "cm" stops flashing.
- 1d. Press "set" until desired unit is displayed ("inch" for domestic, "cm" for all others).
- 1e. Press "mode/enter" to lock the setting in.

Note: Perform only one of the two empty tank height settings below. When doing an automatic tank height calibration (2B), place a piece of white electrical tape on the bottom cone where the laser is incident upon it.

2A. Empty Tank Calibration (manual):

- 2a. Press "mode/enter" until "EMP" (free choice of tank height) is displayed.
- 2b. Press-and-hold "set" until display stops flashing.
- 2c. Set the tank height to the MPI default:
ULTRA-600 57.0 in / 145 cm
ULTRA-1000: 71.0 in / 183 cm
- 2d. Press "mode/enter" to lock the setting in.

2B. Empty Tank Calibration (automatic):

- 2a. Press "mode/enter" until "CEMP" (calibrate-on-empty) is displayed.
- 2b. Press-and-hold "set" until display shows "WAIT".
- 2c. Display will show "done" upon a successful empty calibration.
- 2d. Press "mode/enter" to lock the setting in.

3. Output 2 configuration:

- 3a. Press "mode/enter" until "OU2" is displayed.
- 3b. Press "set" to show the current OU2 setting.
- 3c. Press-and-hold "set" until current OU2 setting flashes.
- 3d. Press "set" until "U" (0-10V) is displayed.
- 3e. Press "mode/enter" to lock the setting in..

4. High level setting:

- 4a. Press "mode/enter" until "AEP" (analog end-point) is displayed.
- 4b. Press "set" to display the current AEP (high level) setting.
- 4c. Press-and-hold "set" until the current AEP flashes.
- 4d. Press "set" until desired high level (MPI factory default: 45.0 in / 114 cm) is displayed.
- 4e. Press "mode/enter" to lock the setting in.

Note: High level units must match units selected in step 1.

5. Setting of the sampling rate:

- 4a. Press "mode/enter" until "EF" (extended functions) is displayed.
- 4b. Press "set".
- 4c. Press "mode/enter" until "rATE" is displayed.
- 4d. Press-and-hold "set" until the current rATE flashes.
- 4e. Press "set" until "1" is displayed.
- 4f. Press "mode/enter" to lock the setting in.

Notes:

1. #1 and #2 are found under the EF (extended functions) menu any time after the initial IFM factory configuration has been completed.

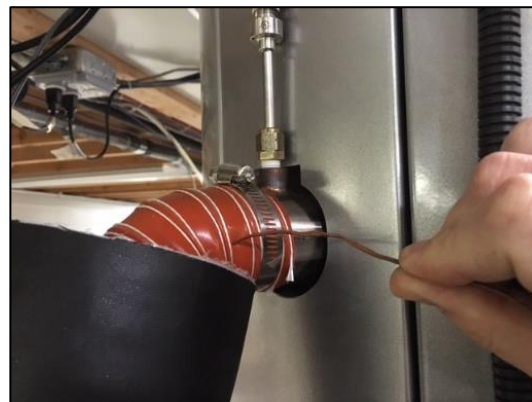
Temperature and Pressure Verification

Should it be deemed necessary to verify the ULTRA's T1a RTD (heating hopper air inlet temperature measurement) and/or pressure sensor (vacuum level reading), this page outlines how to accomplish this. We would first like to state that "perfect" accuracy of both devices is not necessary for the machine to run properly. The manufacturer's advertised accuracy of the RTD sensor used in the ULTRA is to within 1/10th of a degree Celsius and, by the nature of the design, will either work or not work. The RTD should never vary in its accuracy nor can it be calibrated. With that being said, if the temperature were to vary +/- 3 degrees Celsius, most materials will complete the drying process within acceptable tolerance levels. This is not to say that the RTD will vary in the temperature reading, rather most materials dry fine within this tolerance. The pressure sensor, used for vacuum level readings, is accurate to within ± 2 mm Hg. The pressure sensor cannot be calibrated.

T1a RTD Sensor Verification:

The T1a RTD sensor is located about 1/3rd the way up the heating hopper on the hot air inlet tube. Insert a handheld reference thermocouple or RTD through the red silicone hose (make a very small slit with a razor blade to allow for this) as close to the ULTRA's T1a RTD as possible.

Observe the temperature on the top red ULTRA display screen and compare this to a handheld reference temperature sensor.



Pressure Sensor Verification:

The absolute pressure sensor (vacuum level reading) is in the ULTRA electronics cabinet. Sensor accuracy can be verified using two methods. Method one: set the ULTRA to display in millimeters of mercury (default) and compare the reading on the display to a hand-held barometer device located next to the machine. Method two: tap into the 1/4" diameter green pressure sensor air line (see arrow in picture at right) with a barometer device. Measure the barometric pressure within the line. Compare that measurement to what is displayed on the ULTRA display.



Updating the Firmware

When the ULTRA dryer control panel is turned on, the first screen displayed will show the current firmware version. If necessary, the firmware in the ULTRA can be updated using a firmware update supplied by Maguire Products. Firmware updates use the USB port located below the control screen. The following instructions detail how to do a firmware update.

NOTE: maximum USB flash drive size is 32 GB.



Do not turn off controller or remove the flash drive while firmware is updating! Doing so may corrupt the controller's firmware.

Copy	the new firmware update into a USB flash drive. (do not put in a directory)		
Insert	the USB Flash drive into the USB port on the ULTRA.		
Press		Display will prompt for a password. (default: 22222)	Then press: 
Press	System Configuration	Display will show the System Configuration categories.	
Press	Resets	Display will show System reset options.	
Press	Firmware Update	The controller will search the USB drive for a firmware update file with the XUF extension.	
Select	the file from the white display area on the left. If more than one firmware version is stored on the flash drive, multiple version will be displayed in the white display area. If the display is blank check USB for the file and that the file is location directly on the drive (not in a sub-folder). Exit out of this screen and enter again to refresh the display window.		
Highlight	the version in the white panel on the left and press PROGRAM .		
Press		To proceed with the firmware update or press the red X to cancel and exit.	
The display will show progress in transferring to the internal SD card, then it will show progress in verifying the update file. Then the controller will prompt: " Please toggle power. " At this time, remove the flash drive, power off the controller then on. When the controller restarts the display will show progress updating to the new firmware. When complete, the display will show: UPDATES COMPLETE Toggle power. At this time, turn off power, then turn back on.			

Additional Firmware Update Information

Software updates can be supplied electronically, via email or by download. Software updates are named according to their date of release. For instance, **VTU0204A.XUF** can be interpreted as VT=Vacuum Touchscreen, U=2021 (T=2020), 06=February, 04= 4th day, A=the first revision for that day. If there is ever a problem with the ULTRA and the USB port cannot be used or the ULTRA software is corrupted and cannot load new software through the menu, new software can be acquired from Maguire and renamed **VTUPDATE.XUF**. This renamed software can be copied onto the Root Flash Drive and inserted into the USB port of the ULTRA. When the ULTRA is turned on, this **VTUPDATE.XUF** file will be automatically loaded into the ULTRA, restoring the software.

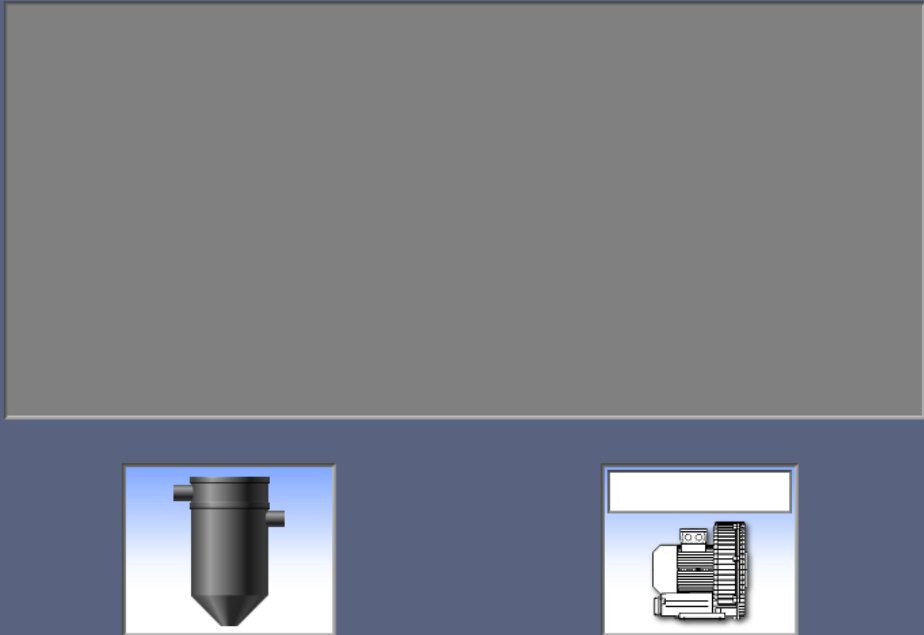
FlexBus Lite Integrated Loading System

The Flexbus Lite Loading System is integrated into the Maguire ULTRA Touchscreen Controller, enabling local control of a single pump and up to 9 receivers. This section, outlines and explains the Flexbus Lite Loading System.

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Flexbus Lite Home Screen Overview

Live View Panel (gray area) - Displays the live view of Receivers		Navigation Menu	
			Home Screen
			Display Pump
			Event Log and Alarm History
			Switch to ULTRA Home Screen
			Setup (password protected)
Receivers Navigation / Setup of all Receivers	Pump Setup of Pump		

Flexbus Lite Setup and Configuration

Flexbus Lite uses a MAC address to individually identify each Flexbus pump and receiver. Identification and numeric assignment of each Flexbus pump and receiver is setup within the Flexbus Lite through the order that the receiver is turned on and discovered during the Pump Assignment routine and the Receiver Assignment routine setup processes.

Once the initial setup has been completed, Flexbus Lite will retain the setup and identification of the pump and each receiver indefinitely. After the initial identification order and numeric assignment has been saved, the operator can later make adjustments to the receiver numeric assignment order and assign a 4-character alphanumeric identification name to each receiver.

Enabling Flexbus Lite in the ULTRA Touchscreen Controller

Flexbus Lite is an option that can be enabled within the ULTRA Touchscreen controller allowing local control of a single pump and up to 9 receivers. Additional components are required for dryer loading including receivers equipped with Flexbus, a T-drop, a position hub, pump module, and necessary cabling. Please see the Flexbus Lite component map on page 118 for setup details.

Press		Display will prompt for a password. (default: 22222)	Then press:	
Press	Dryer Configuration	Display will show the Dryer Configuration categories.		
Press	Convey Setup	Display will show Convey categories.		
Press	Flexbus	Flexbus is now enabled and will display on navigation bar		
Press		To save and exit or press the red X to cancel and exit.		
Press		To access Flexbus Lite.		
Press		To toggle the display back to the ULTRA Dryer controller screen. When the ULTRA controller is displaying the ULTRA dryer icon, Flexbus continues to operate. Press the Flexbus button at any time to return to Flexbus.		

Flexbus Lite System Setup Screen

Pump assignment is set through the SETUP screen. The setup screen is accessed by pressing the Setup button on the right side of the screen.



On the HOME screen, PRESS:		Pressing the SETUP button prompts for a password.
PRESS:	22222	Enter the password (default password is 22222) Press  to confirm password.
This enters the Setup screen. This screen contains several setup specific options.		

Pump and Receivers Setup Buttons
Pressing PUMP or RECEIVERS enters Setup for those devices



Pump: 0



Receivers: 0



Flexbus Lite System Setup Options



Returns to Home screen



Display Pump



Event Log and Alarm History



Switch to ULTRA Home Screen

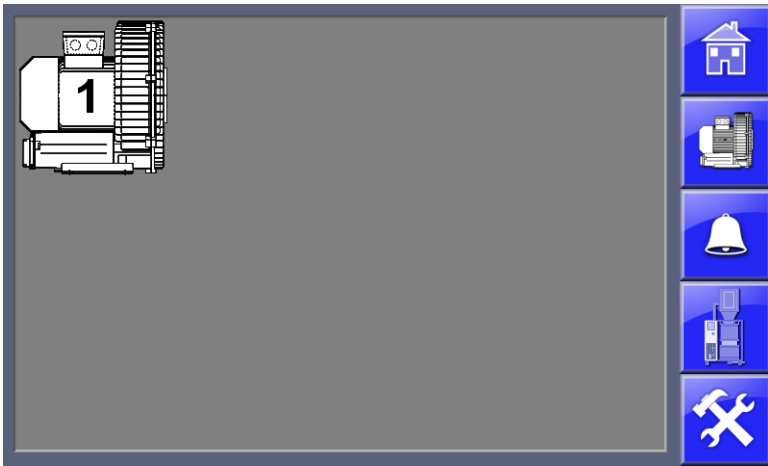


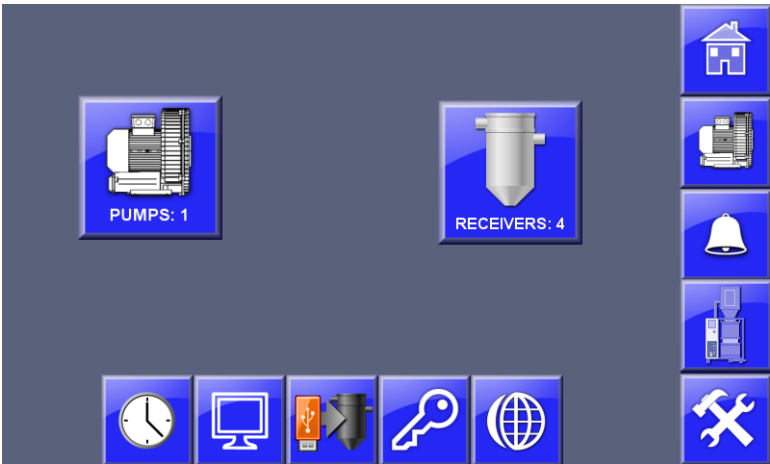
Setup (password protected)

Note: Pump must be assigned before Receivers.
Note: Flexbus Lite uses a single pump and up to 9 receivers.

Pump Assignment - Pumps must be assigned before Receivers.

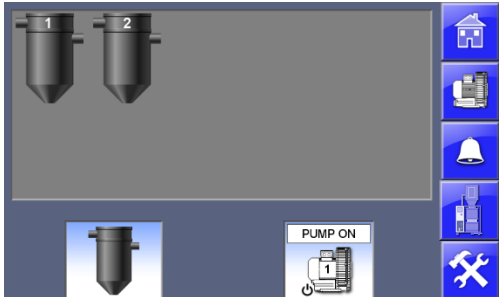
Flexbus Lite controls a single pump. The Flexbus System can control of to 5 pumps. If there are two or more pumps (Flexbus only), turn OFF all pumps prior to running Setup in the Flexbus controller, otherwise: To assign Pumps, follow these instructions:

On the HOME screen, PRESS:		Pressing the SETUP button prompts for a password.
PRESS:	22222	Enter the password (default password is 22222) Press  to confirm password.
This enters the Setup screen. This screen contains several setup specific options.		
To setup Pumps: PRESS:		Press the large Pumps button on the far left of the screen.
This enters the PUMP assignment screen. This gray screen contains any previously assigned pumps. For first time setup, this screen is probably blank and no pumps have been assigned. At this time, turn on the intended Flexbus Lite Pump to assign.		
With a single pump, that pump will appear on the screen and be labeled with the number 1.		
PRESS:		To return to the Setup screen. When you return to the Setup screen, the Pump button will show the Setup symbol  on the Pump button indicating that you are still in the Pump Assignment mode.
PRESS:		To Exit the Pump Assignment Mode. Setup icon  overlaying the button will disappear indicating you are out of Pump assignment mode.

While in the Setup screen you can go straight to setting up Receivers without re-entering the password.		
PRESS:		To enter the Receivers assignment screen. See  Next Page for Receivers Assignment instructions. Otherwise, to exit SETUP...
PRESS:		To exit the Setup screen.

Receiver Assignment

NOTE: If you are already entered into SETUP, skip the password step and go to the  below.

On the HOME screen PRESS:		Pressing the SETUP button prompts for a password.
PRESS:	22222	Enter the password (default password is 22222) Press  to confirm password.
 This enters the Setup screen. This screen contains several setup specific options.		
PRESS:		Press the large Receivers button to enter the Receiver assignment screen.
The gray screen contains any previously assigned Receivers. For first time setup, this screen is probably blank and no Receivers have been assigned. Turn on your Flexbus Receivers in the order that you want then to be assigned.		
Your receivers will appear on the screen and be numbered in the order that they were turned on. If necessary, pressing each receiver icon will allow you to re-assign the ID number to a different unassigned number. Pump  symbol in the pump panel to toggle the Pump online or offline.		
PRESS:		To return to the Setup screen. When you return to the Setup screen, the Receivers button will show the Setup symbol on the pumps button indicating that you are still in the Receiver Assignment mode.
PRESS:		To Exit the Receiver Assignment Mode. Setup icon  will disappear indicating you are out of Receiver assignment mode.
PRESS:		To exit the Setup screen.

Receiver Configuration

The Receiver configuration screen is accessible from the Home screen. Pressing a receiver on the Home Screen, takes you to the Receiver's Configuration screen. The receiver that you are configuring is identified by the Receiver's ID number on the receiver images on this screen. You can select another Receiver by using the Receiver navigation arrows at the bottom center of this screen.

RECEIVER SETUP

LOAD TIME
15

LOAD RETRY
2

DUMP TIME
5

PUMP
1

BLOWBACK
35

2

LOADER ON

PULSE TIME
0.0

PURGE TIME
5

PRIORITY
5

Home

Receiver

Alarm

Receiver

Tools

Receiver Navigation

RECEIVER ON

Left Arrow

Receiver 1

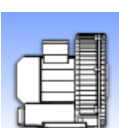
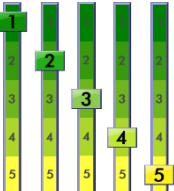
Right Arrow

Receiver Navigation and Status Panel - This multi-function panel displays messages and receiver status, allows for navigation to each Receiver's configuration screen using the arrow buttons, and allows the receiver to be turned OFF or ON.

The receiver symbol can display the following states:

	Pressing the Receiver symbol toggles receiver OFF or ON. This symbol indicates that the receiver is turned off and will not run.
	This symbol indicates that the controller has lost communication with the receiver. The receiver will not run in this state.

Receiver Configuration Fields

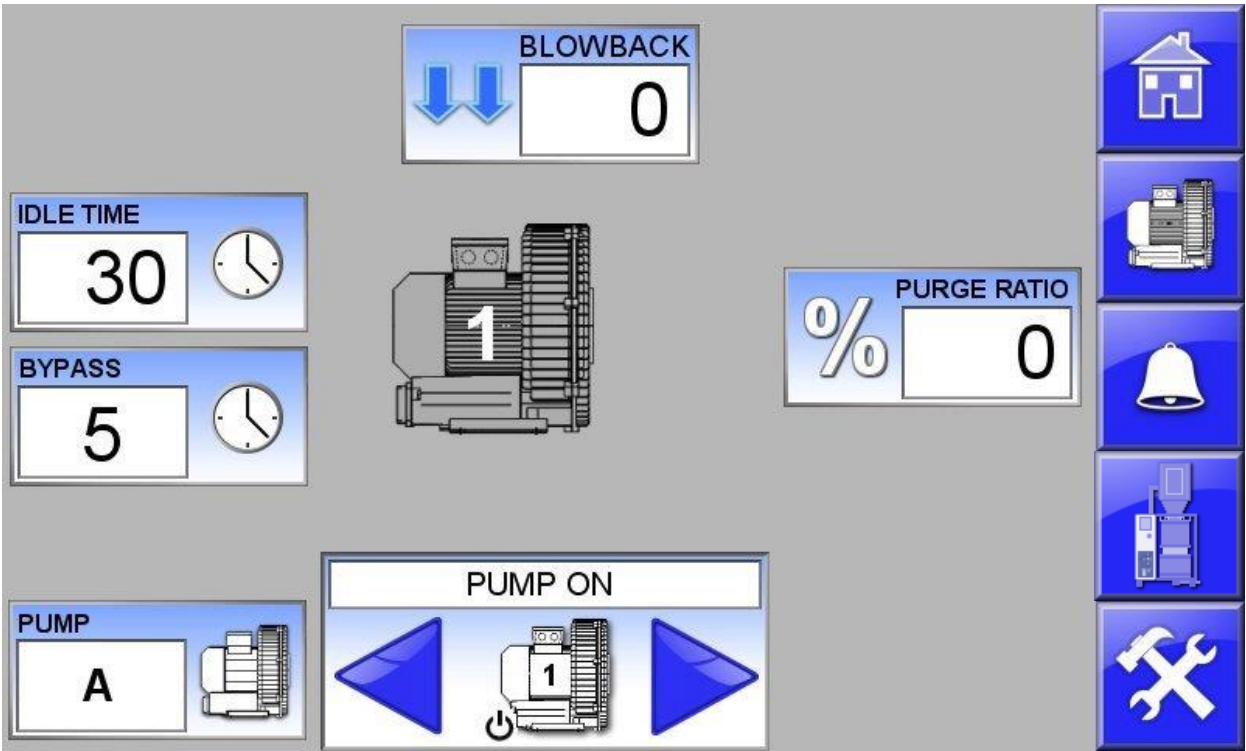
	Blowback - Blowback is a pulse of air to clear the filter. Blowback has two configuration fields. Skip cycle defines the number of cycles the receiver will skip between blowback pulses. Default for Skip Cycle is 3. Setting Skip Cycle to 0 (zero) will pulse every time. Time Interval is a multiplication factor of 400ms to pressurize the charge canister. Default Time Interval is 1 (1=400ms).
	Load Time - The time in seconds that the receiver will load.
	Load Retry - The number of times the receiver will try to successfully load material and satisfy the sensor. Exceeding this retry count will cause the receiver to alarm.
	Dump Time - The time in seconds that the receiver will remain open during the dump cycle.
	Pump Assignment - The ID number of the pump that this receiver is assigned to.
	Pulse Time - Pulsed on-time in tenths of a second that the Bridge Breaker output (output 6) will pulse during Dump Time. (See Flexbus Receiver Card Wiring Diagram, Output 6).
	Purge Time - The time in seconds that the purge valve will open to purge the convey line. (Purge time follows Load time).
	Priority - Sets the order of importance of the receivers. Setting a receiver to level 1 sets to the highest priority, while setting to level 5 sets to the lowest priority. Higher priority receivers receive material first while lower priority receivers receive material later. 
 	Purge - This symbol represents the purge valve. When purging, the symbol will show a blue arrow.
	The Receiver's label and defaults can be reset by touching the large receiver image in the center of the screen.

Pump Configuration

Pressing the pump button in the right navigation takes you to the Pump overview screen and then pressing a pump in this overview screen will open the Pump's Configuration screen. The pump that you are configuring is identified by the pump's ID label on the pump's image on this screen. You can select another pump by using the pump navigation arrows at the bottom center of this screen.



Pump Overview Screen



Pump Configuration Screen

Pump Control

	Pump Status Panel - This panel displays messages and pump status and allows the pump to be turned OFF or ON.
--	---

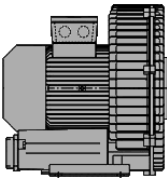
The pump symbol can display the following states:

	Pressing the pump symbol toggles the pump OFF or ON. Message will display PUMP OFF.
	This symbol indicates that the pump has lost communication. The pump will not run in this state. Message will display PUMP LOST COM.

Pump Configuration Fields

	<u>Blowback</u> - Blowback is a pulse of air to clear the filter. Blowback has two configuration fields. Skip cycle defines the number of Bypass cycles skipped between each blowback pulse. Default for Skip Cycle is 10. Setting Skip Cycle to 0 (zero) will pulse every time. Time Interval is a multiplication factor of 400ms to pressurize the charge canister. Default Time Interval is 5 (1=400ms).
	<u>IDLE TIME</u> - The time in minutes that the pump runs after the last convey request before shutting off.
	<u>BYPASS</u> - The time delay in 10ths of seconds (0-50, zero seconds to 5 seconds) before the Bypass valve opens after all receivers are satisfied.
	<u>PURGE RATIO</u> - The % of time split between two purge valves. Used to clear material that overshoots the receiver.
	<u>PUMP</u> - Selects between pump A or pump B outputs.

Pump Labeling

	Pressing the Pump's image in the center of the screen displays information about the pump and allows the Pump's label and defaults can be reset.
---	--

Removing Receivers from the configuration

If a receiver needs to be removed from the configuration, it can be removed using this procedure.

On the HOME screen PRESS:		Pressing the SETUP button prompts for a password.
PRESS:	22222	Enter the password (default password is 22222) Press  to confirm password.
This enters the Setup screen. This screen contains several setup specific options.		
PRESS:		Press the large Receiver button.
The screen will contain any previously assigned devices (Pumps or Receivers). A device must be turned off or communication must be disconnected to remove the device. When a device is turned off or communication to the device is disconnected, the loader or pump icon will show a red X over it. The red X enables the option for the device to be removed by pressing the device.		
PRESS:		To remove the receiver.
A prompt to remove the receiver will be shown.		
PRESS:		To return to the Setup screen. When you return to the Setup screen, the Receivers button will show the Setup symbol indicating that you are still in the Receiver Assignment mode.
PRESS:		To Exit the Assignment Mode. Setup icon will disappear indicating you are out of the assignment mode.
PRESS:		To exit the Setup screen.

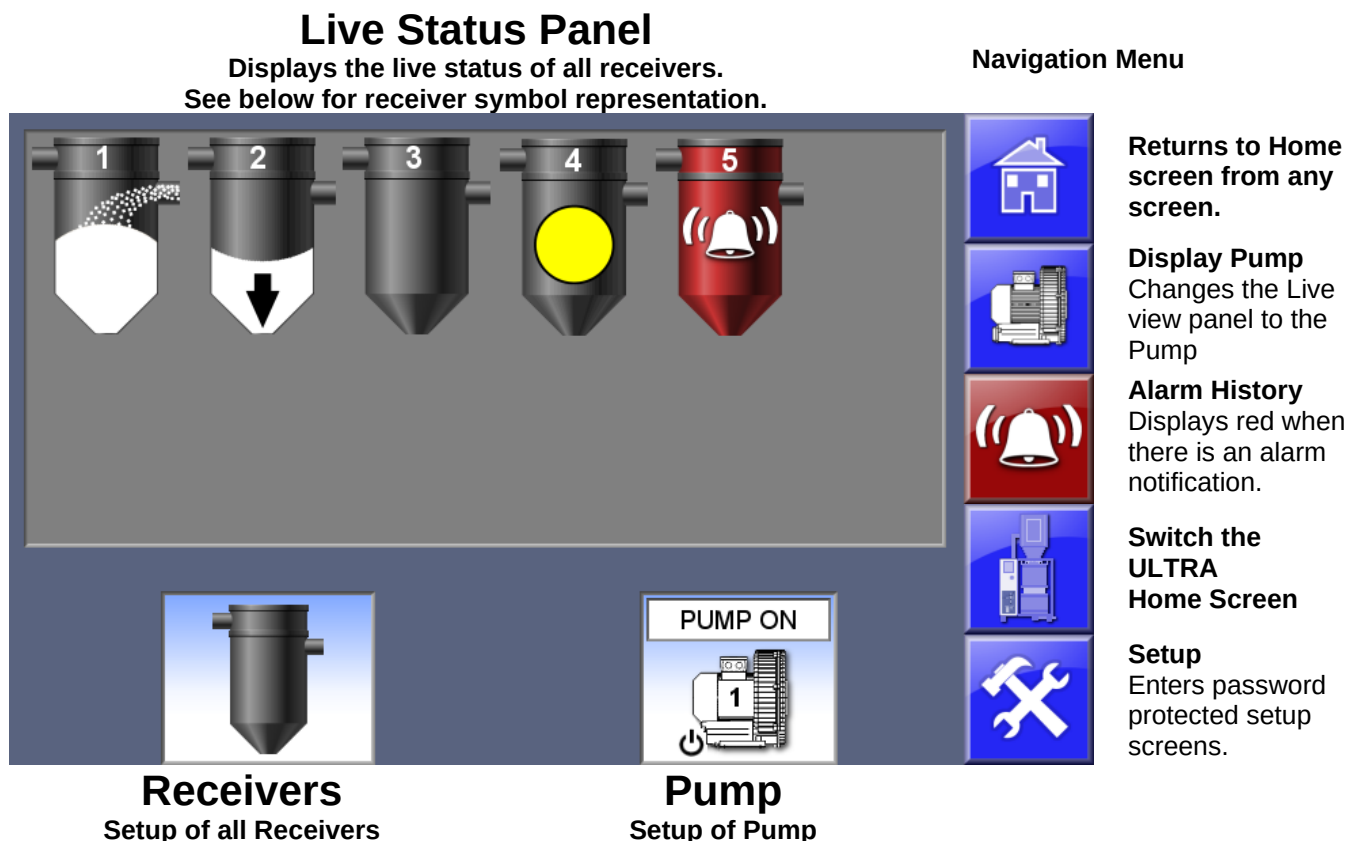
Flexbus Lite System Setup Options



The Setup screen also allows for setting: Date and time, screensaver timeout, screen brightness, screen calibration, updating Flexbus controller and receiver/pump firmware, changing the password, language selection and date format. To enter Setup press the Setup button on the home screen. Default password is 22222.

	Set Date and Time
	Set Screen Brightness
	Update Receiver and Pump Firmware Requires a firmware update provided by Maguire Products Inc. Copy firmware (.XUF file) to USB and insert USB into the controllers USB port. Press this Update button. Press the green check  to start the update. The firmware update will be copied from the flash drive to the Pumps and Receivers that require the update (up-to-date firmware will not be changed). When the copy has completed, you will be prompted to toggle power (off/on). Updates to devices are logged in the Alarm/Event log.
	Change Passwords Set the Operator password and the Administrator password.  Operator Password - When enabled, all Pump and Receiver parameter fields are password protected.  Administrator Password - Changes the Administrator password. Type the new password, then type the password again in the 2nd field to confirm. Valid passwords are numbers 0-9, 1 to 6 characters long. Press the green check  when complete.
	Set Language

Flexbus Lite Main Screen

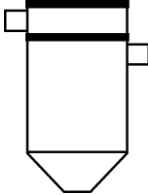
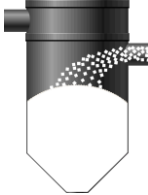
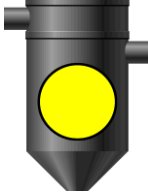
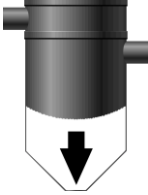
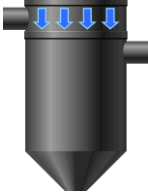


Live Status Panel

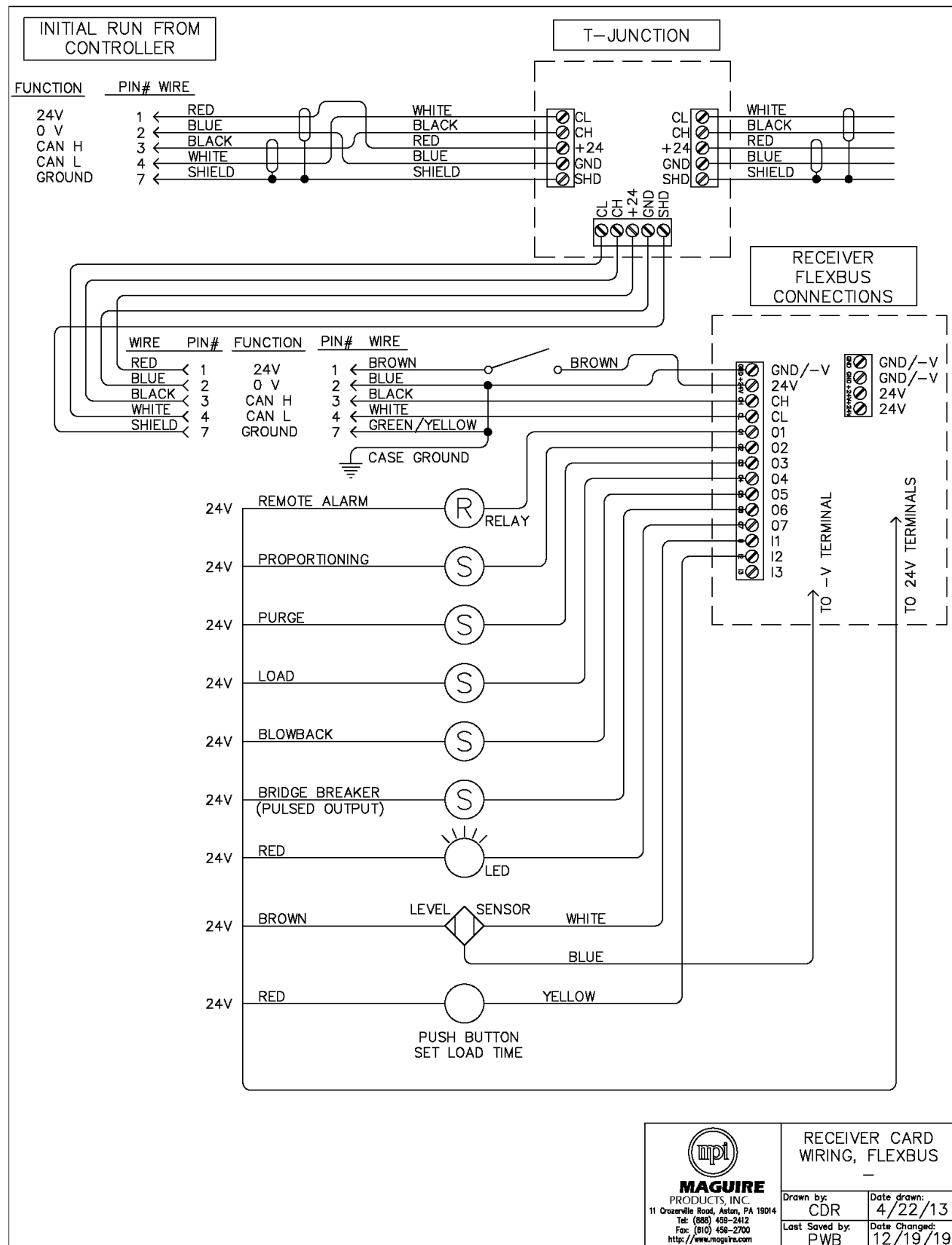
In the Live Status Panel, the receivers will display their current status. See the next page for a description of each live receiver status symbol.

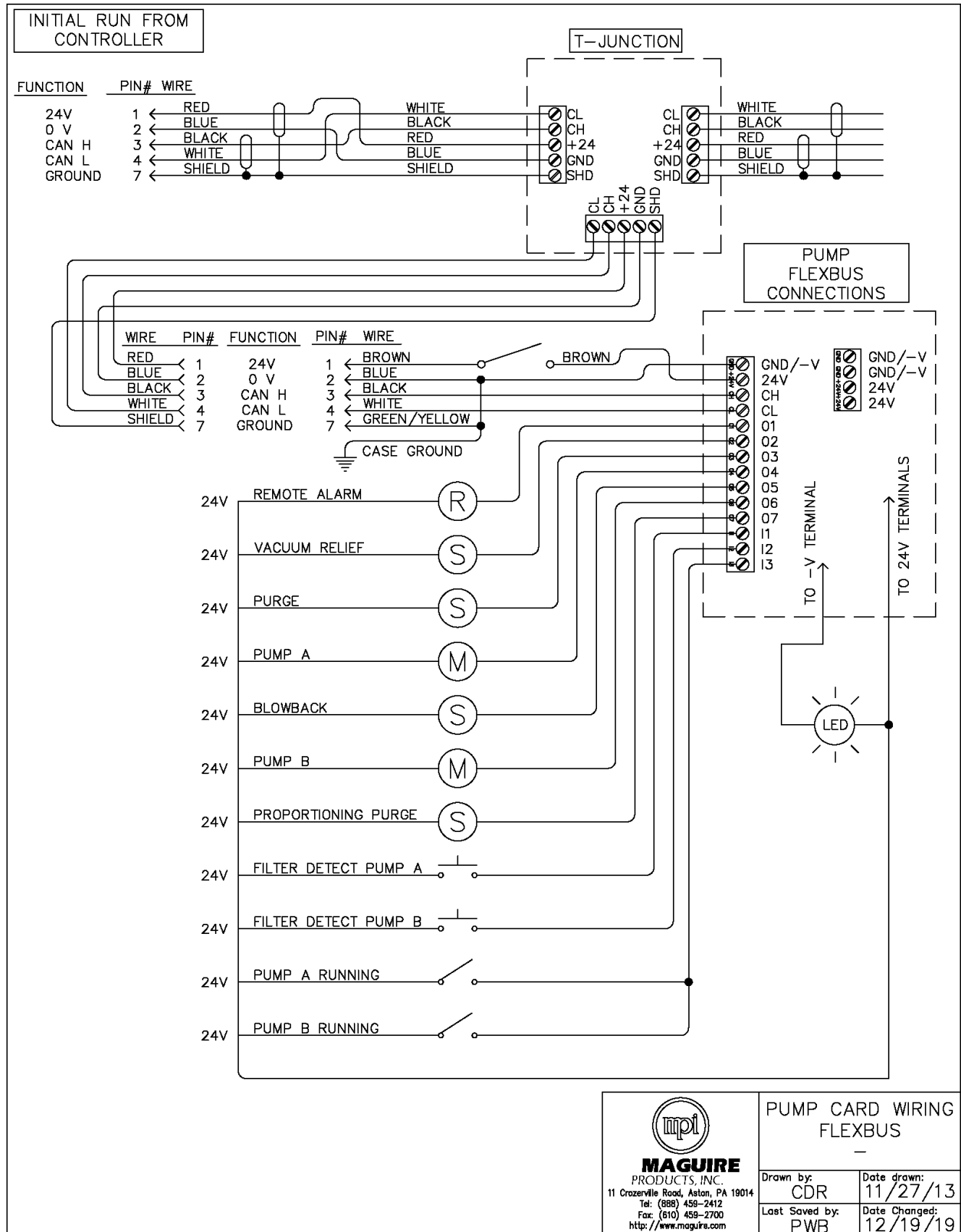
Pressing any of the receiver symbols in the Live Status Panel will display the Receiver Configuration screen for that specific receiver. See Receiver Configuration for more information on configuring receivers.

What the Receiver Symbols Represent:

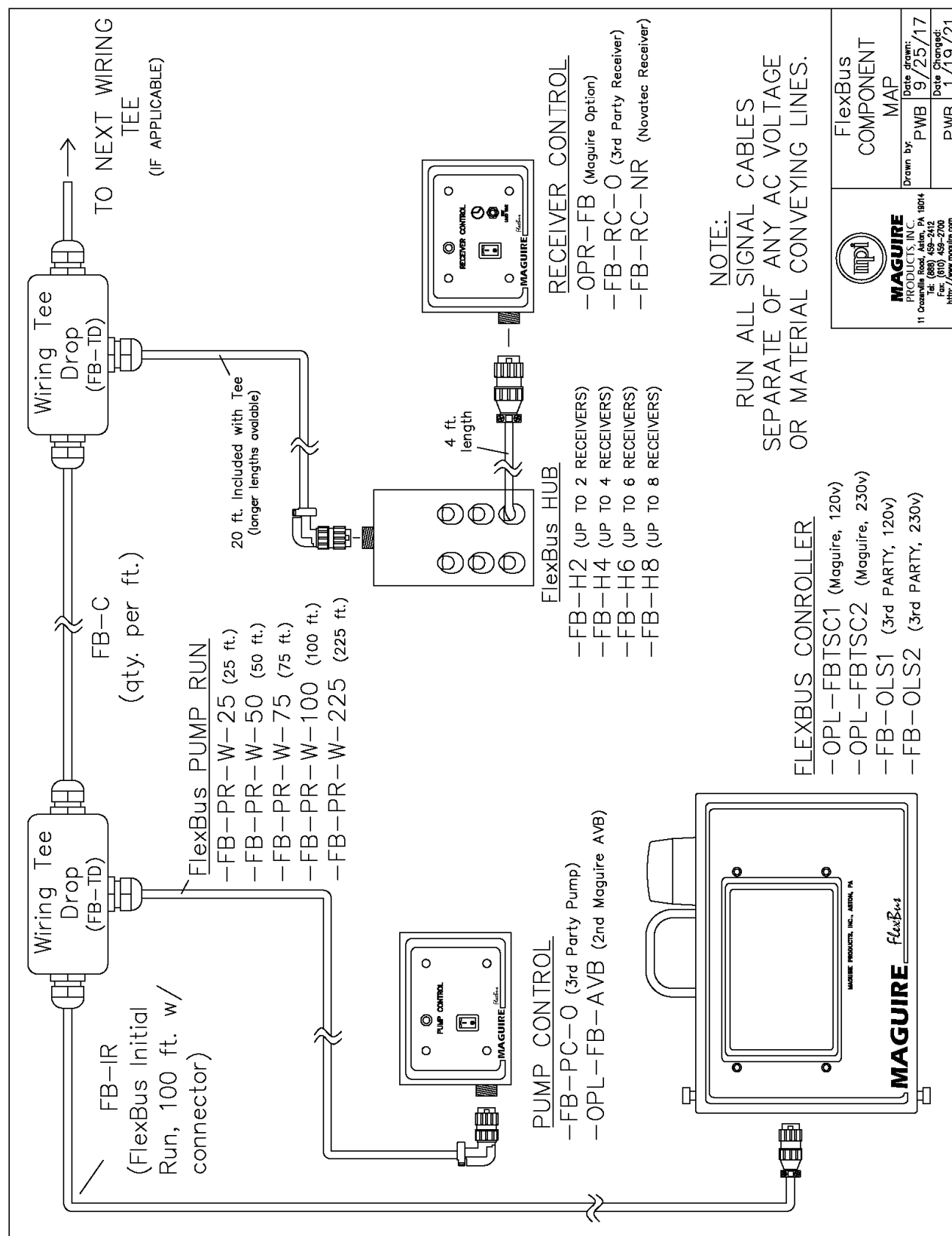
	Receiver is online and idle.		Lost communication with receiver. Cause may be receiver's power is off or a disconnected communication wire.
	Receiver is inactive.		Receiver is alarming.
	Virgin material filling receiver.		Regrind material filling receiver.
	Demand for material.		Material discharging
	Virgin material only purging.		Regrind material only purging.
	Proportioned material purging.		Blowback active. Cleaning receiver's air filter.

Flexbus Lite Wiring Diagrams





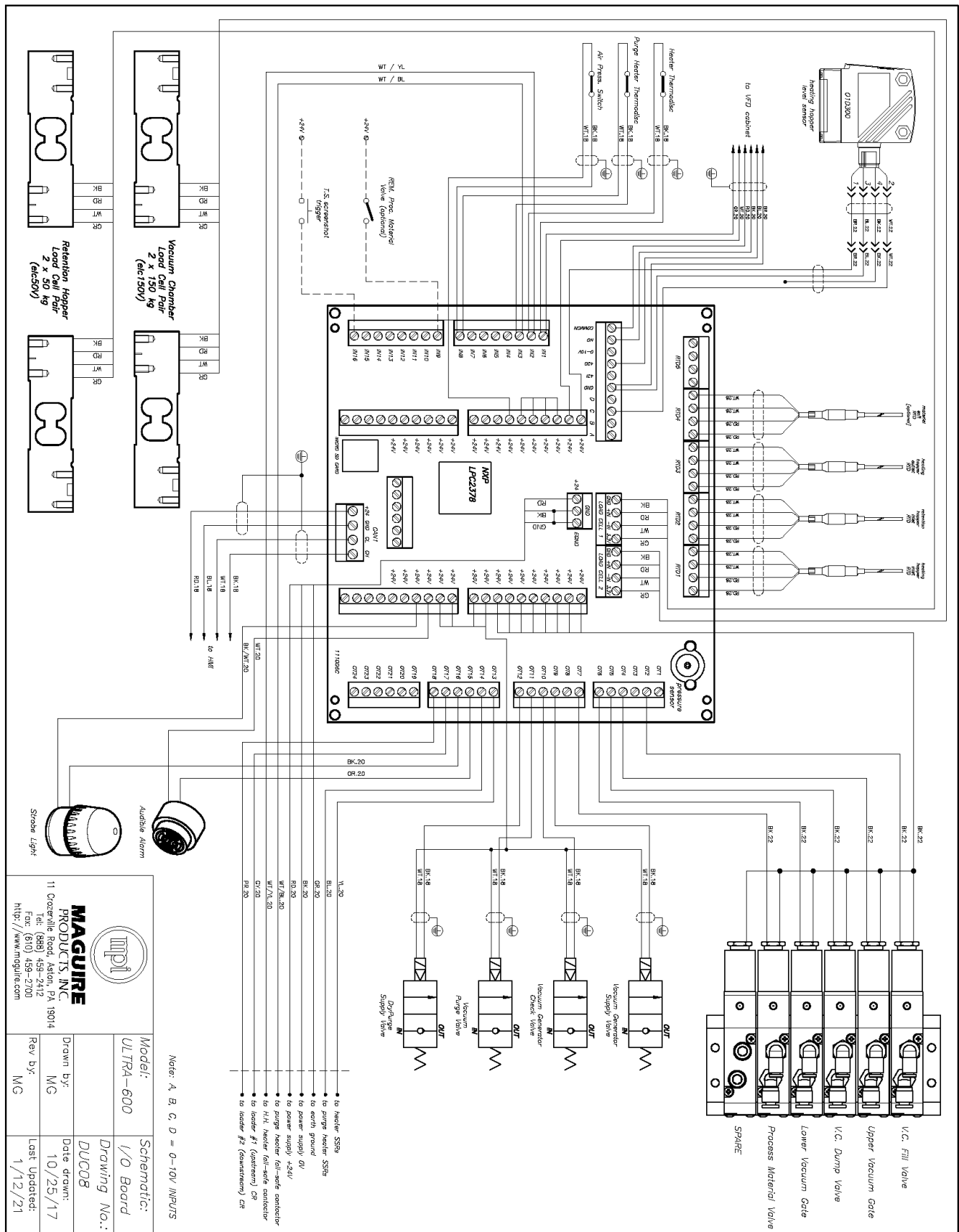
Flexbus Lite Component Map



Technical Documentation: ULTRA-600

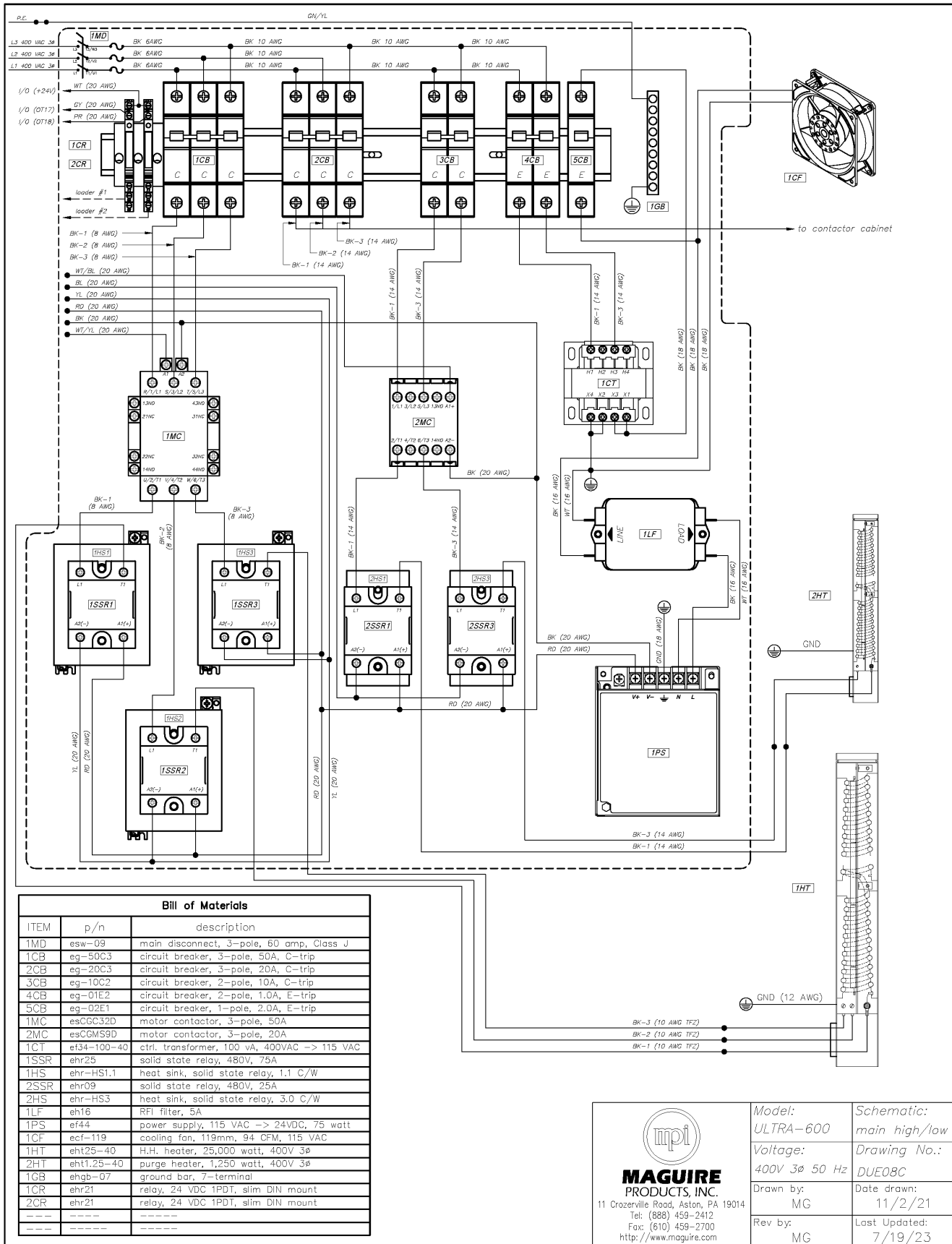
line #	parameter	Domestic/Canadian		European	
		value	units	value	units
1	design throughput	600	lbs./hour	272	kgs./hour
2	maximum run temperature	350	°F	176	°C
3	maximum vacuum level, absolute	75	mm Hg.	75	mm Hg.
4	complete unit weight, empty	1824	lbs.	827	kgs.
5	overall unit height	161.5	inches	4.10	meters
6	voltage	480 / 575	volts	380	volts
7	full load amps (FLA)	49 / 22	amps	54	amps
8	phase	3	∅	3	∅
9	frequency	60	Hz	50	Hz
10	compressed air requirement, sustained press.	85	psi	5.86	bar
11	compressed air requirement, max flow rate	28	SCFM	43.6	N m³/hr
12	compressed air requirement, average flow rate	11.2	SCFM	17.4	N m³/hr
13	blower model	RBH8-805-3	All-Star	RBH8-805-3	All-Star
14	blower power	8.5	HP	5.5	kW
15	blower maximum rated airflow	400	SCFM	578	m³/hour
16	blower maximum rated pressure	116	inches H ₂ O	270	mbar
17	blower noise level	79	db(A)	74	db(A)
18	heater power	25,000	watts	25,000	watts
19	vacuum generator model	JS-350	Vaccon	JS-350	Vaccon
20	heating hopper cylinder I.D.	24	in.	610	mm
21	heating hopper cylinder height	46	in.	1168	mm
22	heating hopper material capacity	12	cu. ft.	339.8	L
23	heating hopper absolute capacity	13.875	cu. ft.	392.9	L
24	heating hopper empty weight	349	lbs.	158	kgs.
25	vacuum chamber cylinder I.D.	24	in.	610	mm
26	vacuum chamber cylinder height	17.875	in.	454	mm
27	vacuum chamber material capacity	5.5	cu. ft.	155.7	L
28	vacuum chamber absolute air capacity	6.5	cu. ft.	184.1	L
29	vacuum chamber normal evacuation volume	3.75	cu. ft.	106.2	L
30	vacuum chamber empty weight	217	lbs.	98.4	kgs.
31	retention hopper cylinder I.D.	28	in.	711	mm
32	retention hopper cylinder height	16.5	in.	419	mm
33	retention hopper material capacity	6.125	cu. ft.	173.4	L
34	retention hopper absolute capacity	7.625	cu. ft.	215.9	L
35	retention hopper empty weight	77	lbs.	34.9	kgs.

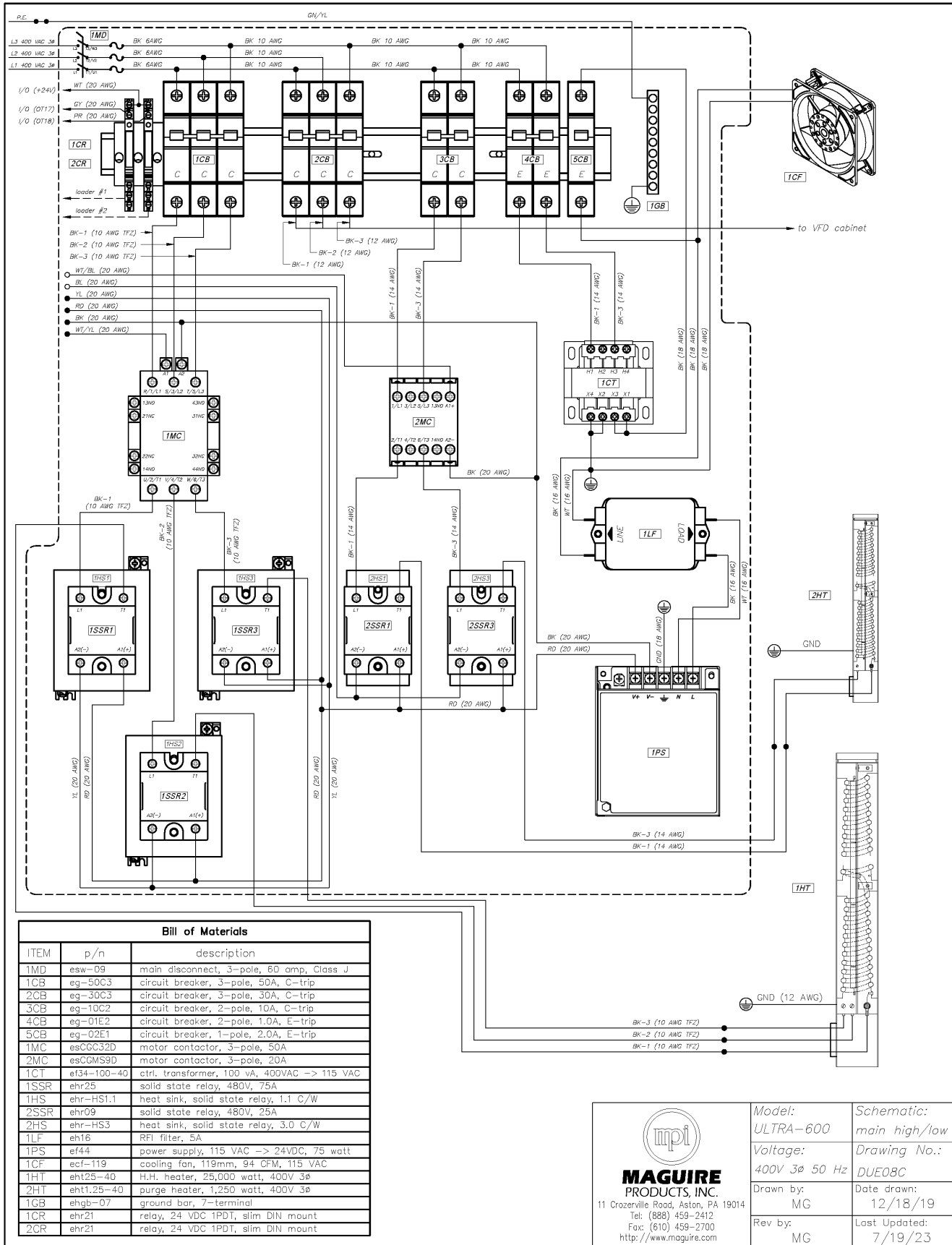
ULTRA-600 I/O Board Wiring Diagram

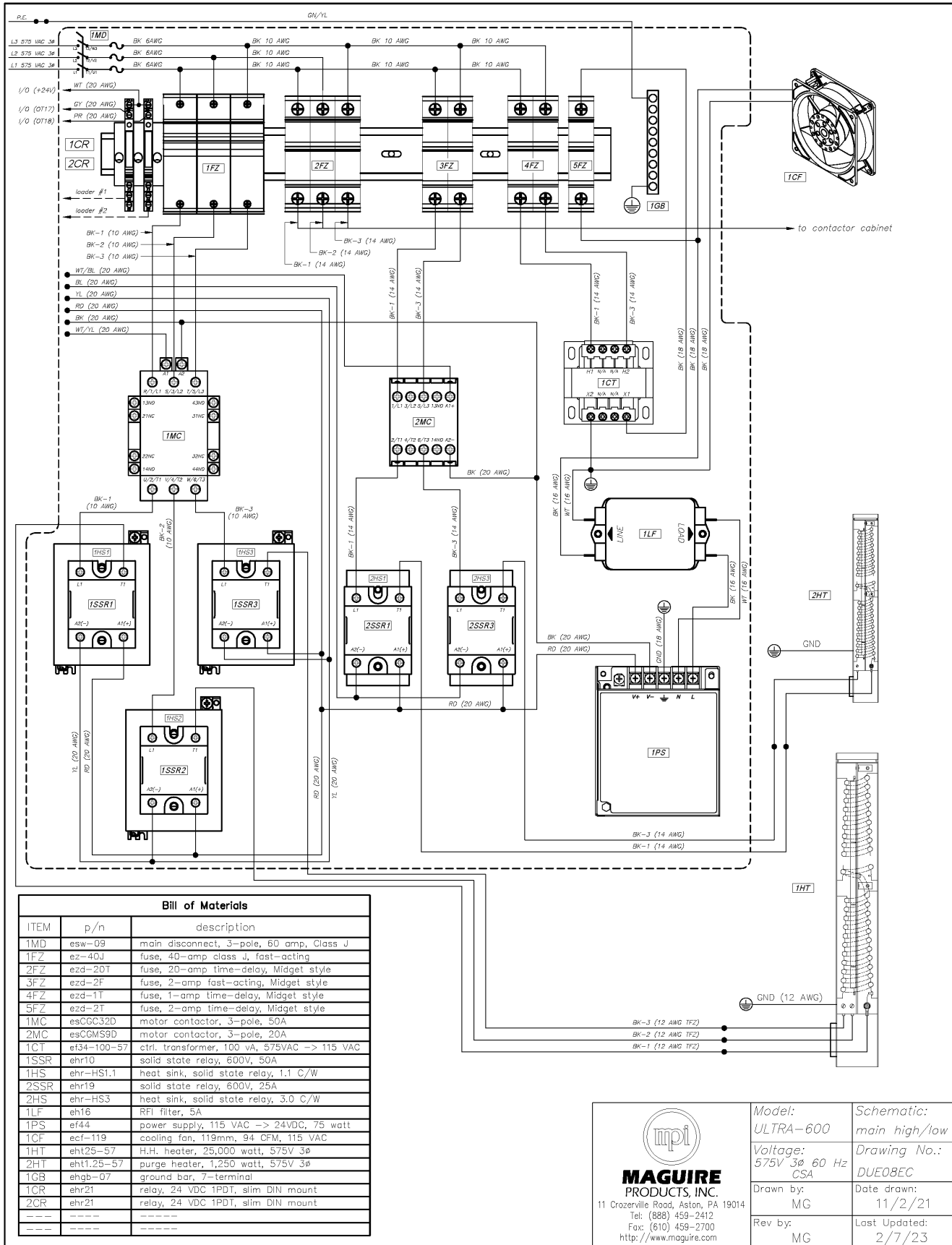


High Voltage Schematics

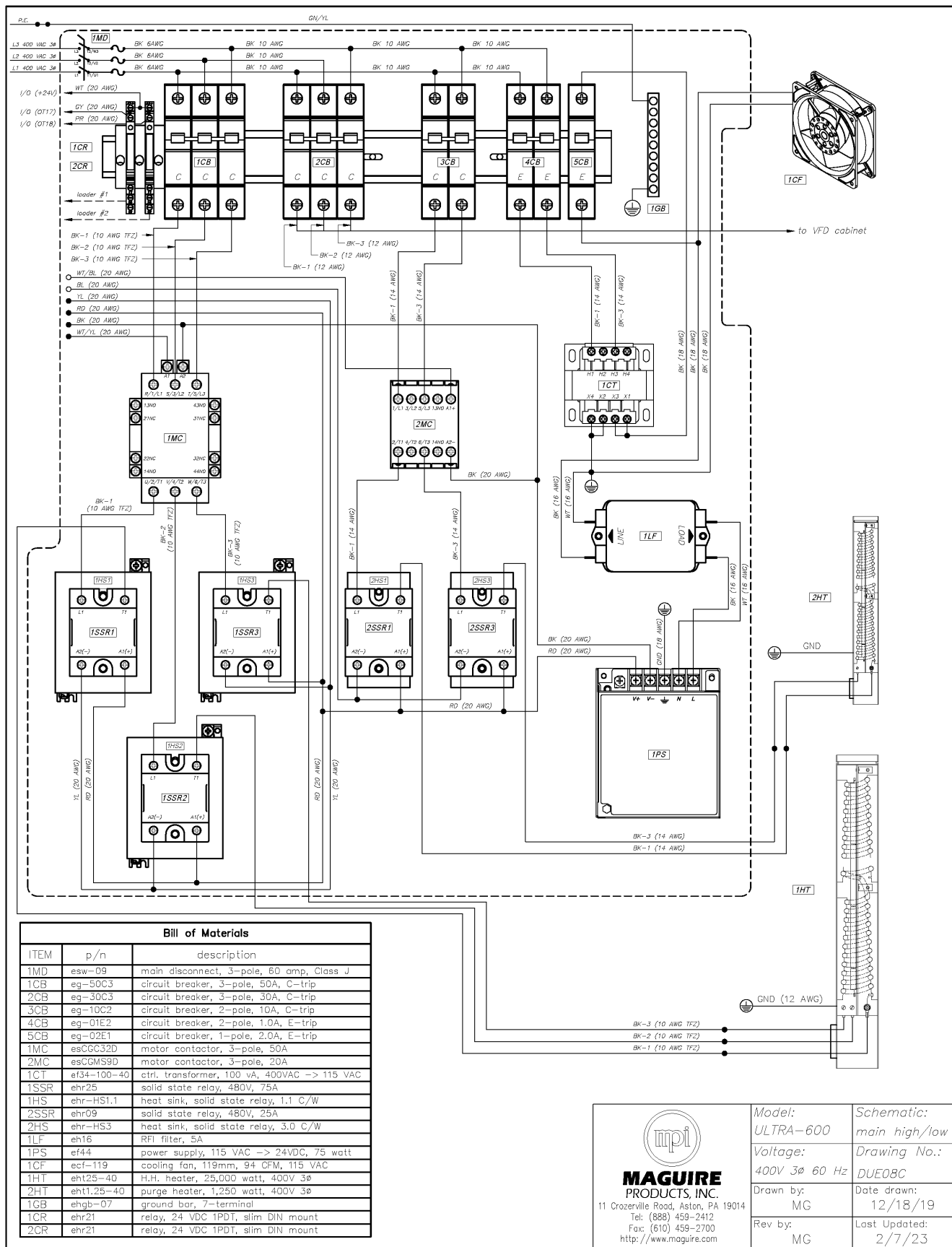
ULTRA-600 – 400V (No VFD)

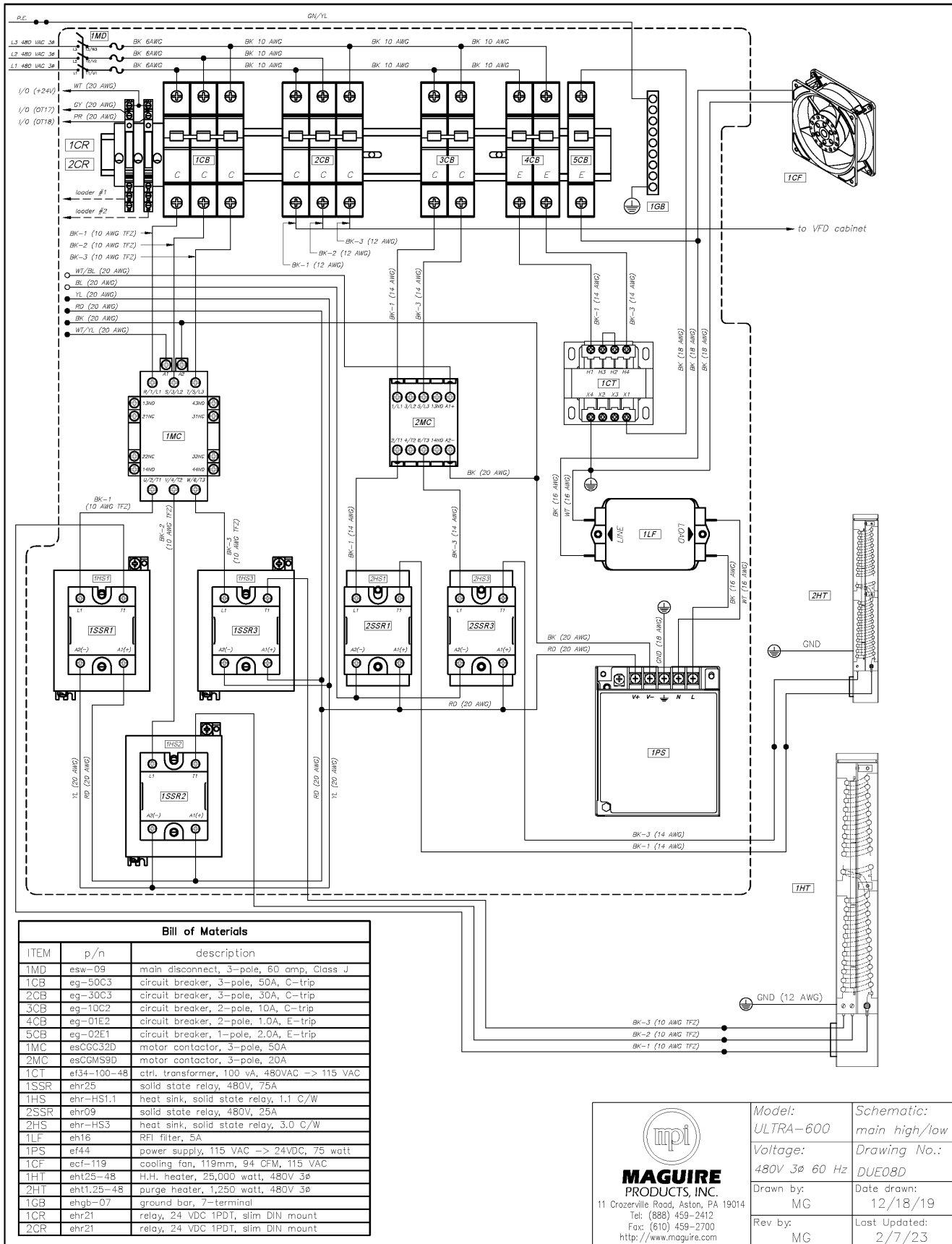


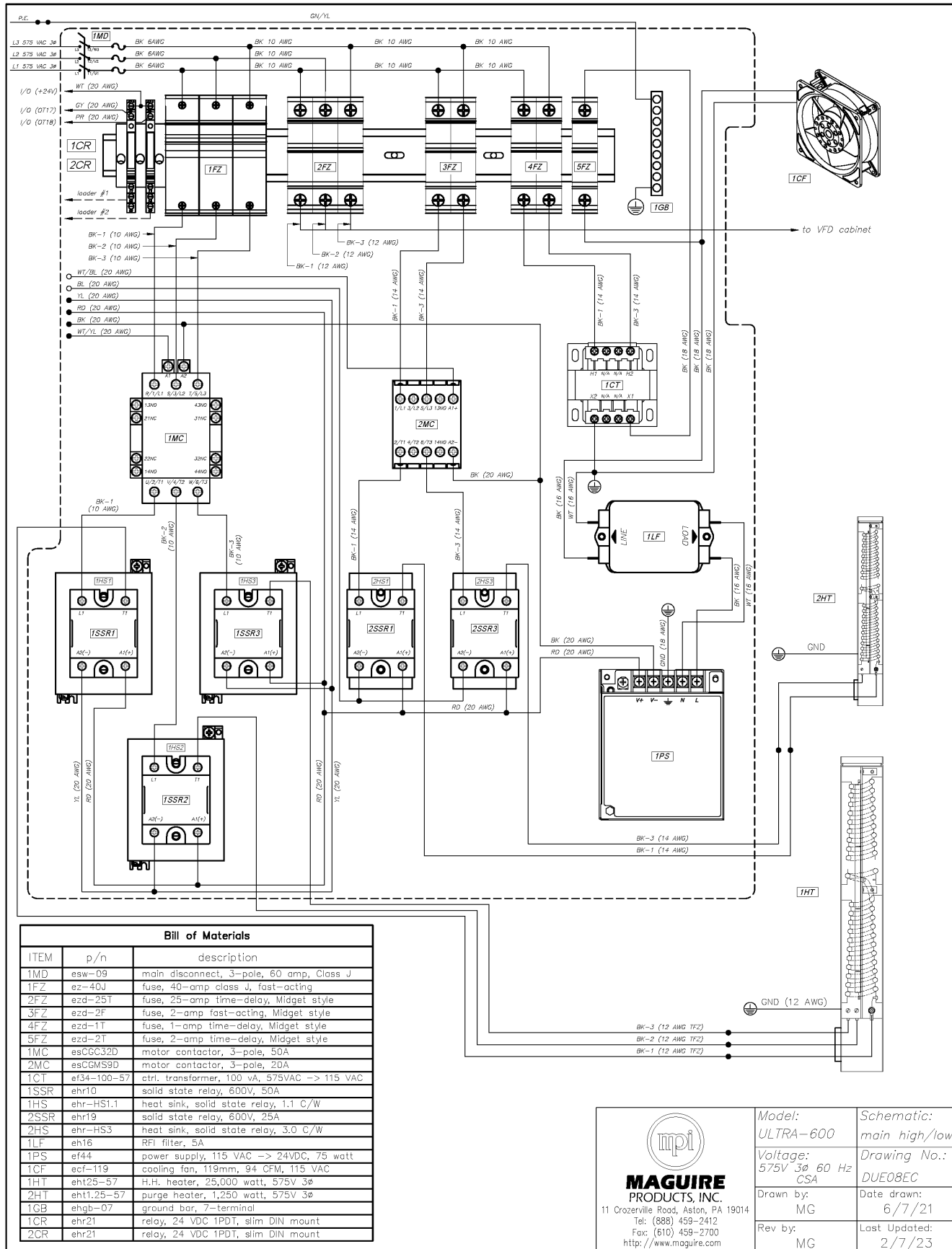
ULTRA-600 – 480V (No VFD)

ULTRA-600 – 575V (No VFD)

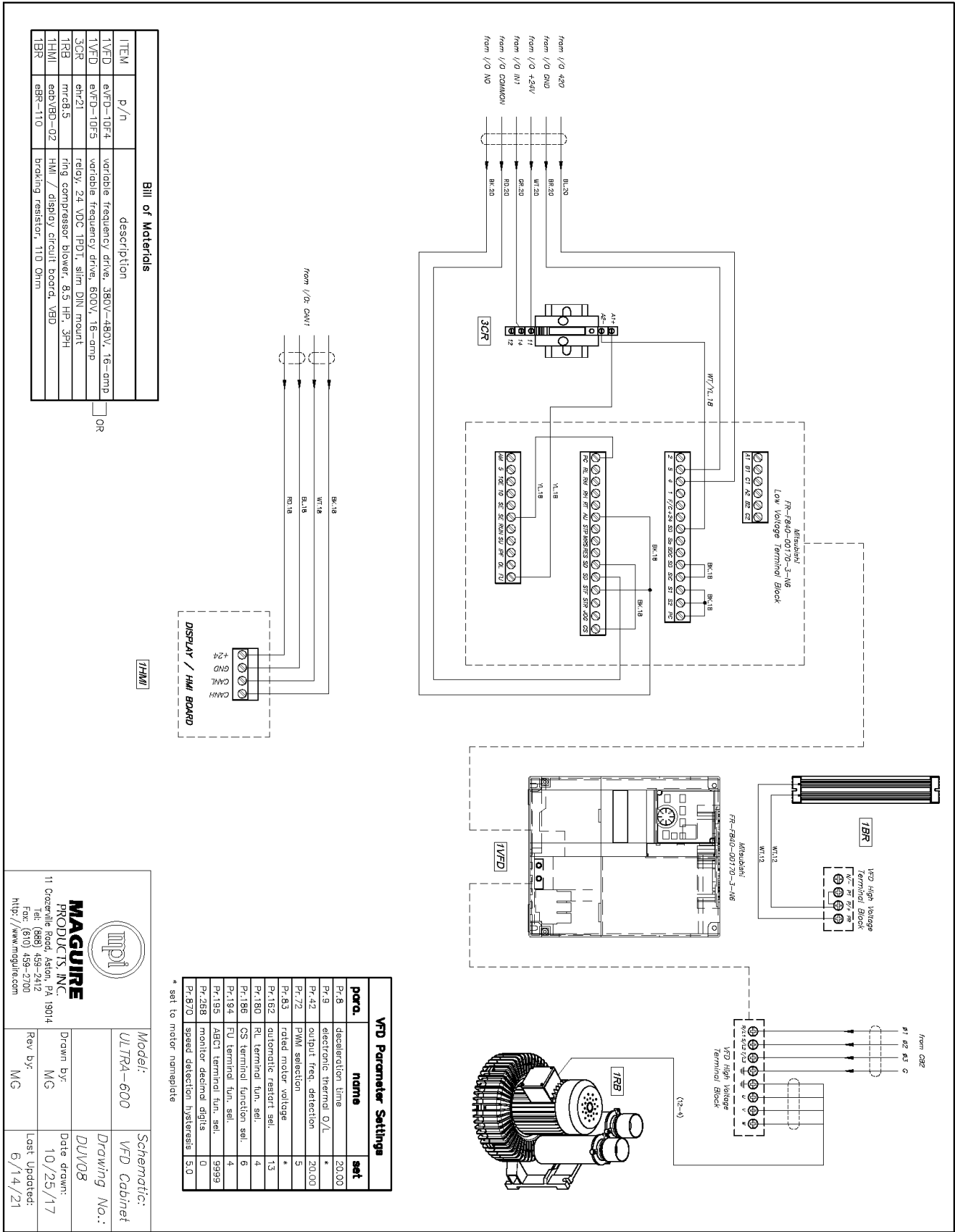
[illegible]

ULTRA-600 – 400V (VFD)

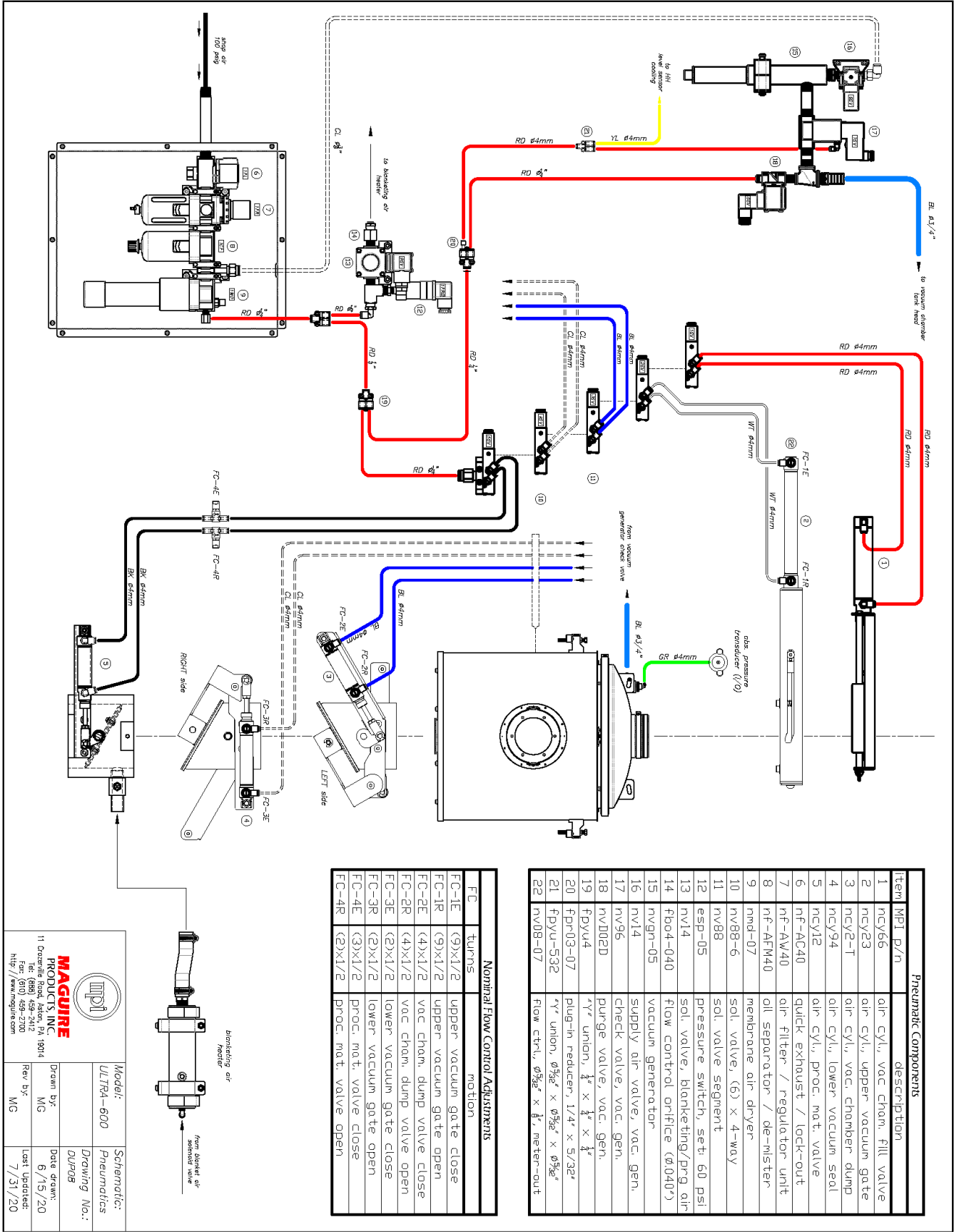
ULTRA-600 – 480V (VFD)

ULTRA-600 – 575V – CSA (VFD)

ULTRA-600 – Contactor Cabinet (VFD)



ULTRA – 600 Pneumatic Diagram



ULTRA-600 Recommended Spare Parts List

ULTRA-600 Recommended Spare Parts List

Note: it is recommended that items #1 - #8 be kept on hand by the maintenance department.

line item	MPI p/n	Description	General Location
1	hf23-E	replacement filter element, blower intake	upper rear panel
2	8324-11	silicone seal, vacuum chamber dump valve	vacuum chamber
3	go-365V	o-ring, size 365, Viton	upper vacuum gate
4	go-359V	o-ring, size 359, Viton	lower vacuum gate
5	8324-03	vac. seal plate assy., vac. cham. dump valve	lower vacuum gate
6	nv88-sol	solenoid valve segment, 4-way, 24 VDC	main cabinet
7	nf-AW40f	filter element, for "AW30" series regulator	pneumatics cabinet
8	nf-AFM40f	filter element, for oil separator	pneumatics cabinet

Other Potential Replacement Parts

9	es4TAT5	fuse, 60-amp class J, AJT60	electrical cabinet
10	eg-01E2	circuit breaker, 1-amp, E-trip, 2-pole	electrical cabinet
11	eg-02E1	circuit breaker, 2-amp, E-trip, 1-pole	electrical cabinet
12	eg-10C2	circuit breaker, 10-amp, E-trip, 2-pole	electrical cabinet
13	eg-30C3	circuit breaker, 30-amp, C-trip, 3-pole	electrical cabinet
14	eg-50C3	circuit breaker, 50-amp, C-trip, 3-pole	electrical cabinet
15	es3RT2016	motor contactor, 3-pole, 20A, 24 VDC	electrical cabinet
16	esCGC32D	motor contactor, 3-pole, 50A, 24 VDC	electrical cabinet
17	ehr09	relay, SS, 480V 25A, 24-265 VAC signal	electrical cabinet
18	ehr25	relay, SS, 480V 75A, 24-265 VAC signal	electrical cabinet
19	eRTD2-40-192	RTD temp. sensor, 1/8" dia. x 2-1/2" long, Pt100	heating hopper
20	eRTD2-32-352	RTD temp. sensor, 1/8" dia. x 2" long, Pt100	mat. outflow valve
21	elc50V	load cell, 50 kg capacity	retention hopper
22	elc150V	load cell, 150 kg capacity	vacuum chamber
23	esp-05	pressure switch, 60 psi set-point, 1/8" NPT	main cabinet
24	eabVBD-01	I/O circuit board	electrical cabinet
25	eabVBD-02	display / HMI circuit board	front control panel
26	eabVBD-03	pendant circuit board (.8" 4-digit numeric)	front control panel
27	ebTS-7V	touch screen	front control panel
28	nmd-07E	replacement element, for membrane air dryer	pneumatics cabinet
29	eht25-40	tube heater, 25,000 watt 3-phase 400 VAC	main cabinet
30	eht25-48	tube heater, 25,000 watt 3-phase 480 VAC	main cabinet
31	ehsl-02	strobe light, red, magnetic base, 24VDC	electrical cabinet
32	ehb-2	piezo buzzer, 24VDC	electrical cabinet
33	esw-09H	interlock handle, red/yellow pistol	electrical cabinet
34	ecf-120	cooling fan, 120mm, 106 CFM, 115VAC .24A	electrical cabinet

Technical Documentation: ULTRA-1000

line #	parameter	Domestic/Canadian		European	
		value	units	value	units
1	design throughput	1000	lbs./hour	454	kgs./hour
2	maximum run temperature	350	°F	180	°C
3	maximum vacuum level, absolute	75	mm Hg.	75	mm Hg.
4	complete unit weight, empty	2950	lbs.	1338	kgs.
5	overall unit height	178	inches	4.52	meters
6	overall unit height w/ sub frame	194	inches	4.92	meters
7	voltage	480 / 575	volts	400	volts
8	full load amps (FLA)	67 / 37	amps	75	amps
9	phase	3	Ø	3	Ø
10	frequency	60	Hz	50	Hz
11	compressed air requirement, sustained pres.	85	psi	5.86	bar
12	compressed air requirement, max flow rate	33.0	SCFM	51.4	N m ³ /hr
13	compressed air requirement, avg. flow rate	18.9	SCFM	29.4	N m ³ /hr
14	blower model	HP-6C23	Cincinnati	HP-6C23	Cincinnati
15	blower power	10	HP	7.46	kW
16	blower maximum rated airflow	600	SCFM	1020	m ³ /hour
17	blower maximum rated pressure	30	inches H ₂ O	75	mbar
18	blower noise level	78	db(A)	78	db(A)
19	primary heater power	35,000	watts	35,000	watts
20	purge heater power	1,250	watts	1,250	watts
21	vacuum generator model	pi CLASSIC x6	PIAB	pi CLASSIC x6	PIAB
22	heating hopper cylinder I.D.	31.94	in.	811	mm
23	heating hopper cylinder height	47.06	in.	1195	mm
24	heating hopper absolute capacity	26.1	cu. ft.	739	L
25	heating hopper material cap., no drop tube	24.3	cu. ft.	688	L
26	heating hopper material cap., 8" drop tube	20.6	cu. ft.	583	L
27	heating hopper empty weight	478	lbs.	217	kgs.
28	vacuum chamber cylinder I.D.	32	in.	813	mm
29	vacuum chamber cylinder height	17.125	in.	435	mm
30	vacuum chamber material capacity	10	cu. ft.	283	L
31	vacuum chamber absolute air capacity	17.4	cu. ft.	493	L
32	vacuum chamber normal evacuation vol.	12.8	cu. ft.	362	L
33	vacuum chamber weight, empty	311	lbs.	141	kgs.
34	retention hopper cylinder I.D.	36	in.	914	mm
35	retention hopper cylinder height	16.5	in.	419	mm

The diagram illustrates the electrical architecture of the IMPI ULTRA-1000 system. Key components and their connections include:

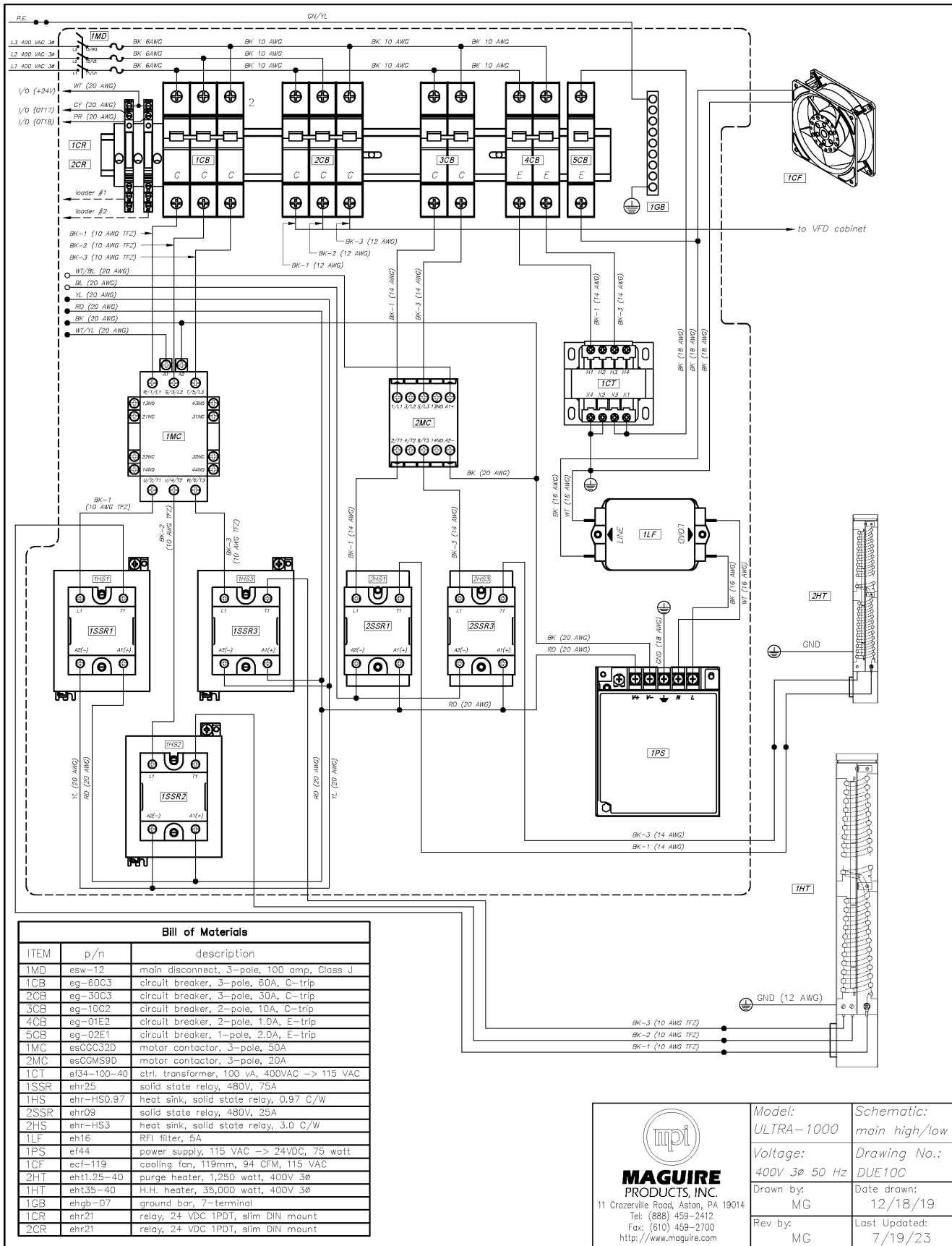
- Heating Hopper (010X00):** Connected to a +24V supply and ground. It includes a heating element and a thermistor.
- Vacuum Chamber (250 kg):** Connected to a +24V supply and ground. It includes a vacuum pump and a pressure transducer.
- Retention Hopper (2 x 100 kg):** Connected to a +24V supply and ground. It includes a heating element and a thermistor.
- Heaters and Thermistors:** Various heaters (e.g., BK-18, BK-20) and thermistors (e.g., WT-18, WT-20) are connected to the +24V supply and ground.
- Pressure Transducers:** Connected to the +24V supply and ground. They provide feedback for the vacuum level.
- Valves:** Various valves (e.g., BK-18, BK-20) are connected to the +24V supply and ground. They control the flow of material and gas.
- Wiring Block:** A central block that distributes power and signals to all components. It includes terminals for +24V, ground, and various signals.
- Legend:** A table at the bottom right explaining the symbols used in the diagram. It includes symbols for power supply, ground, signal, and various components.

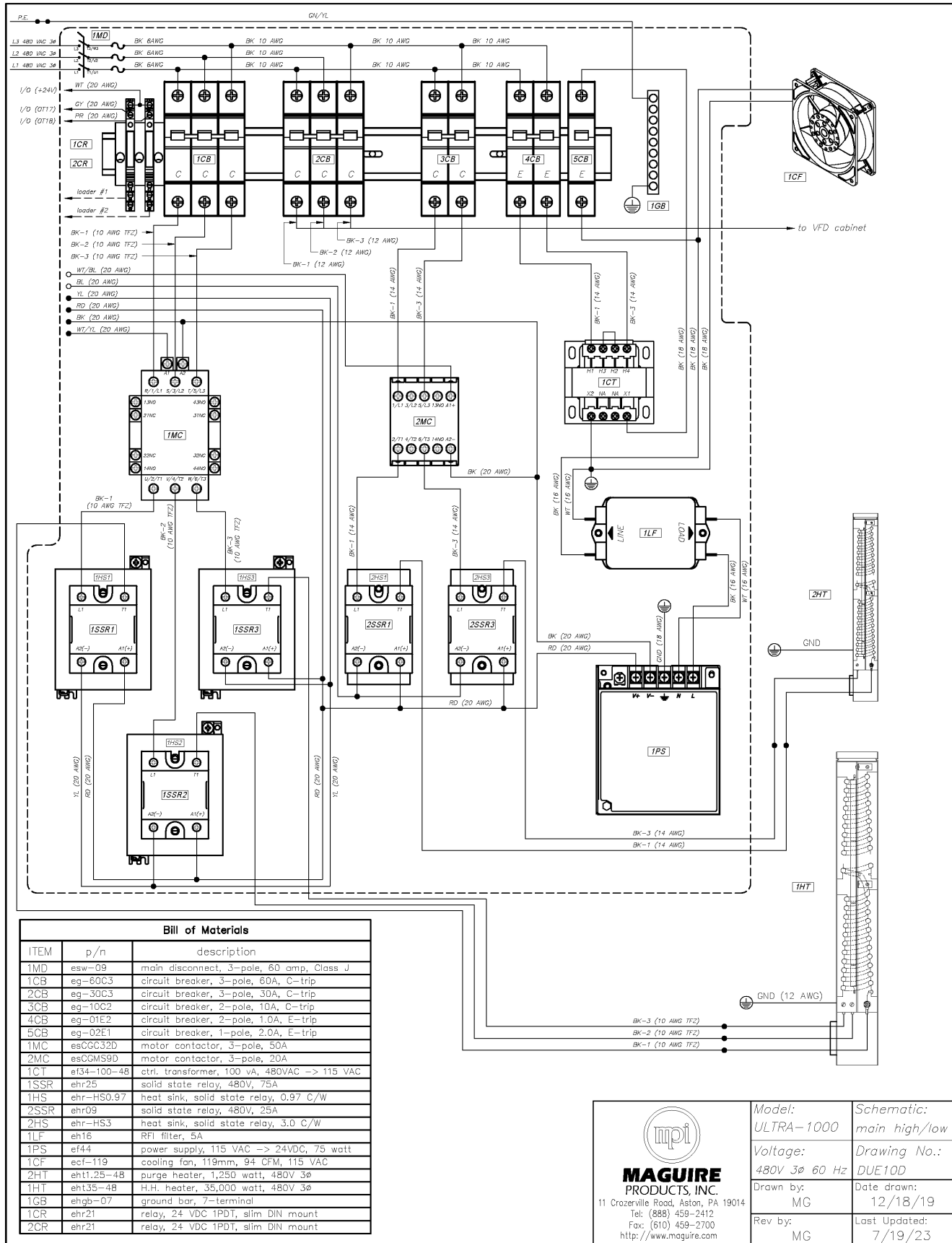
Legend:

Symbol	Description
+	to heater SSRs
+	to purge heater SSRs
+	to earth ground
+	to power supply +24V
+	to purge heater fail-safe contactor
+	to H/H heater fail-safe contactor
+	to under #1 (optional) CR
+	to under #2 (optional) CR

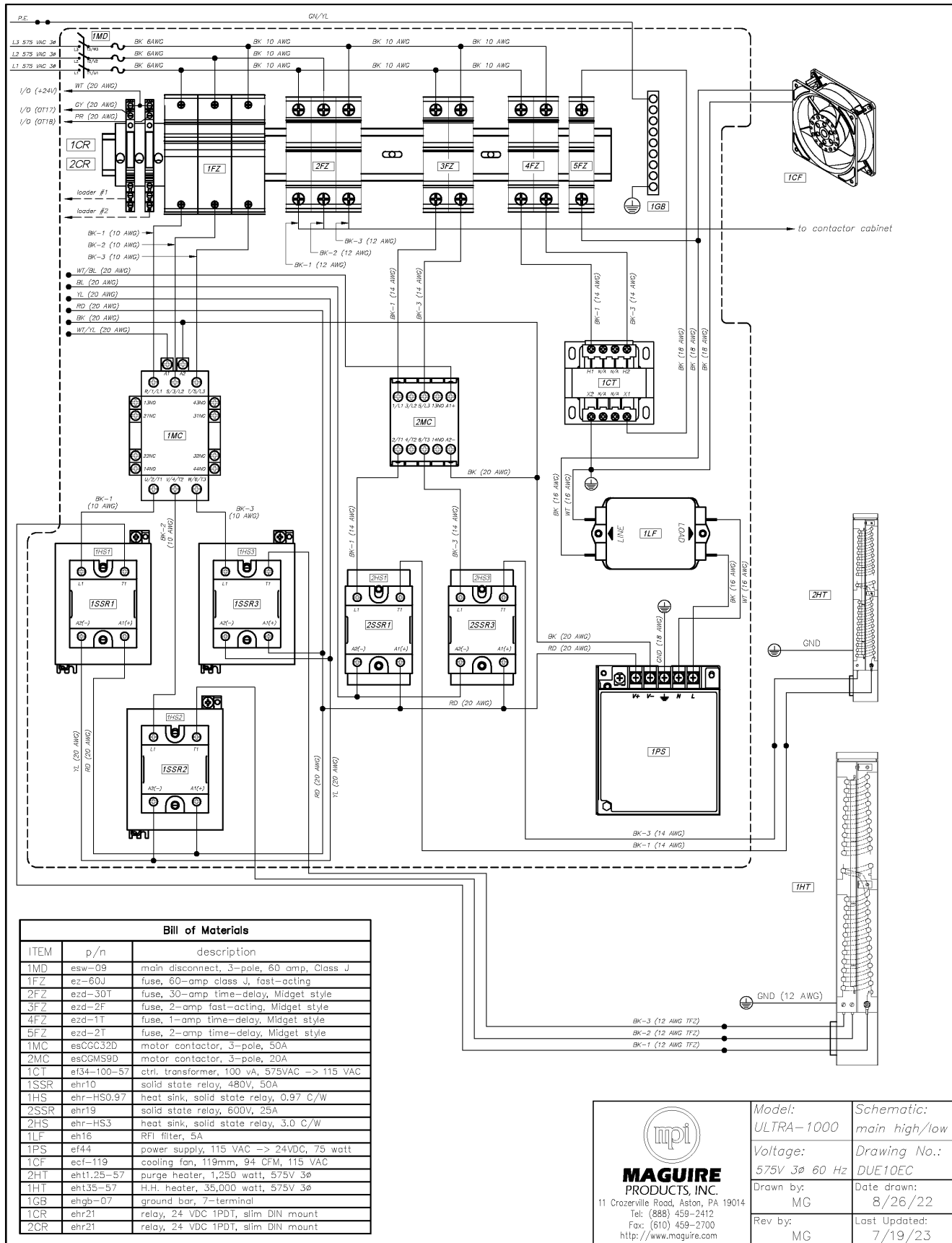
High Voltage Schematics

ULTRA-1000 – 400V

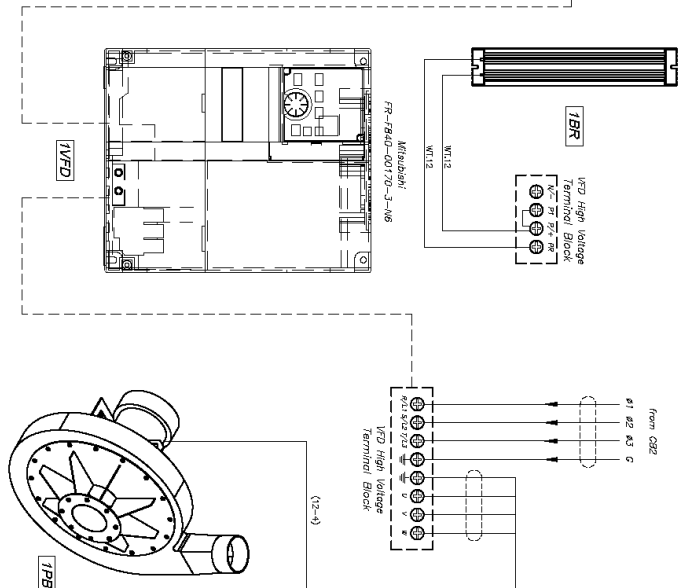
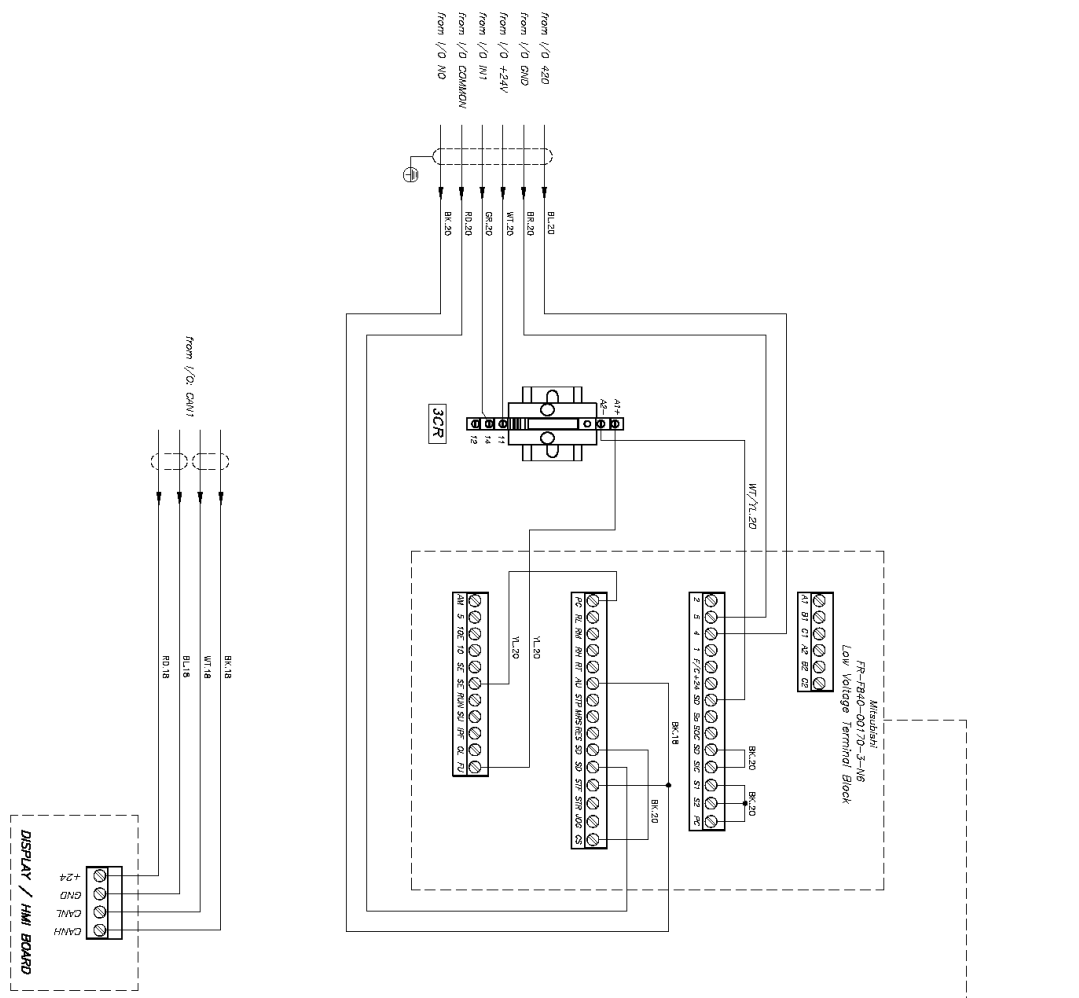


ULTRA-1000 – 480V

ULTRA-1000 – 575V



Bill of Materials		
ITEM	p/n	description
1VFD	aVFD-10F4	variable frequency drive, 3ø, 16 amp
3CR	ahr21	relay, 24 VDC 1PDT, slim DIN mount
1PB	asmrchPBC	pressure blower assembly, 10 HP
1HMI	comVBD-02	HMI / display circuit board, VBD
1BR	gBR-110	braking resistor, 110 Ohm

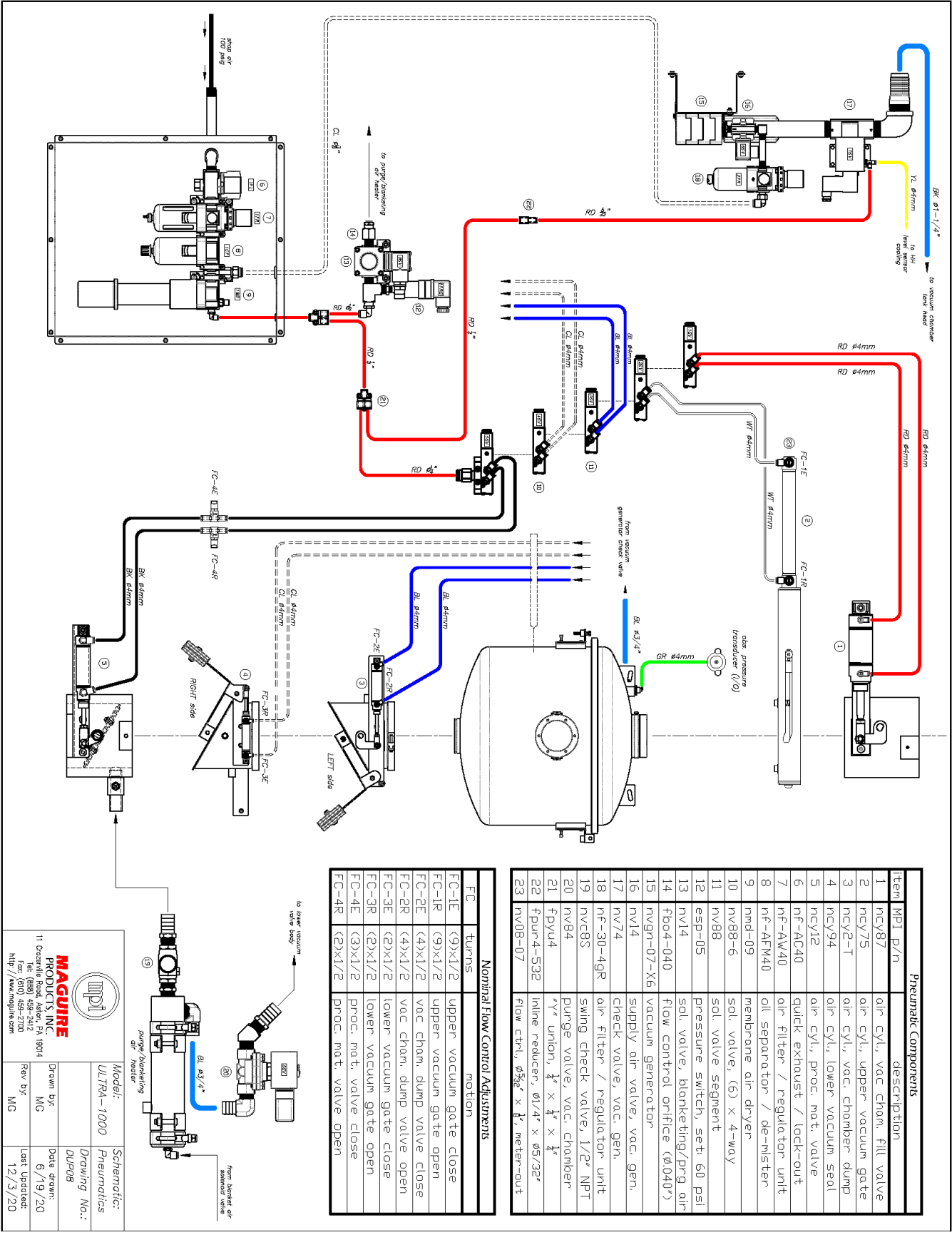


VFD Parameter Settings		
para.	name	set
P1-8	deceleration time	20.00
P1-9	electronic thermal O/L	*
P1-42	output freq. detection	20.00
P1-72	PAW selection	5
P1-63	rated motor voltage	*
P1-62	automatic restart sel.	13
P1-180	RL terminal fun. sel.	4
P1-188	CS terminal function sel.	6
P1-194	FL terminal fun. sel.	5
P1-195	A&C terminal fun. sel.	9999
P1-268	monitor decimal digits	0
P1-870	speed detection hysteresis	5.0

```
* set to motor nameplate
```

	Model:	Schematic:
	ULTRA-1000	VFD Cabinet
	Drawing No.:	
	DW10	
MAGUIRE	Drawn by:	Date drawn:
PRODUCTS, INC.	MG	10/25/17
11 Cozenville Road, Aston, PA 19014	Rev. by:	Last Updated:
Cell: (680) 455-2412		
Fax: (680) 455-2412		

ULTRA – 1000 Pneumatic Diagram



ULTRA-1000 Recommended Spare Parts List

ULTRA-1000 Recommended Spare Parts List

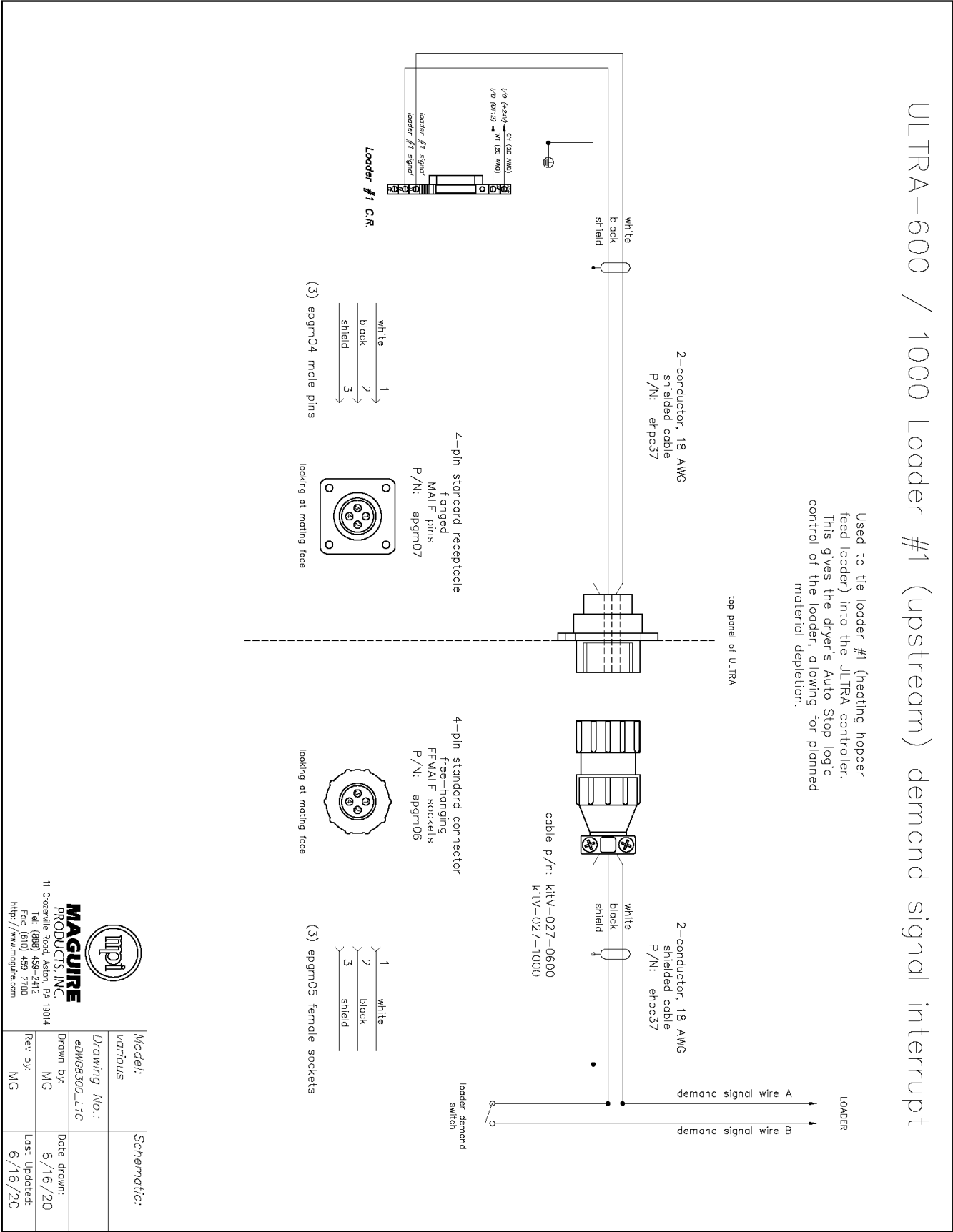
Note: it is recommended that items #1 - #8 be kept on hand by the maintenance department.

line item	MPI p/n	Description	General Location
1	hf21-E	replacement filter element, blower intake	upper rear panel
2	8520-10	silicone seal, vacuum chamber dump valve	vacuum chamber
3	go-369V	o-ring, size 369, Viton	upper vacuum gate
4	go-364V	o-ring, size 364, Viton	lower vacuum gate
5	8520-03	vac. seal plate assy., vac. cham. dump valve	lower vacuum gate
6	nvD-seg	solenoid valve segment, 4-way, 24 VDC	main cabinet
7	nf-AW40f	filter element, for "AW30" series regulator	pneumatics cabinet
8	nf-AFM40f	filter element, for oil separator	pneumatics cabinet

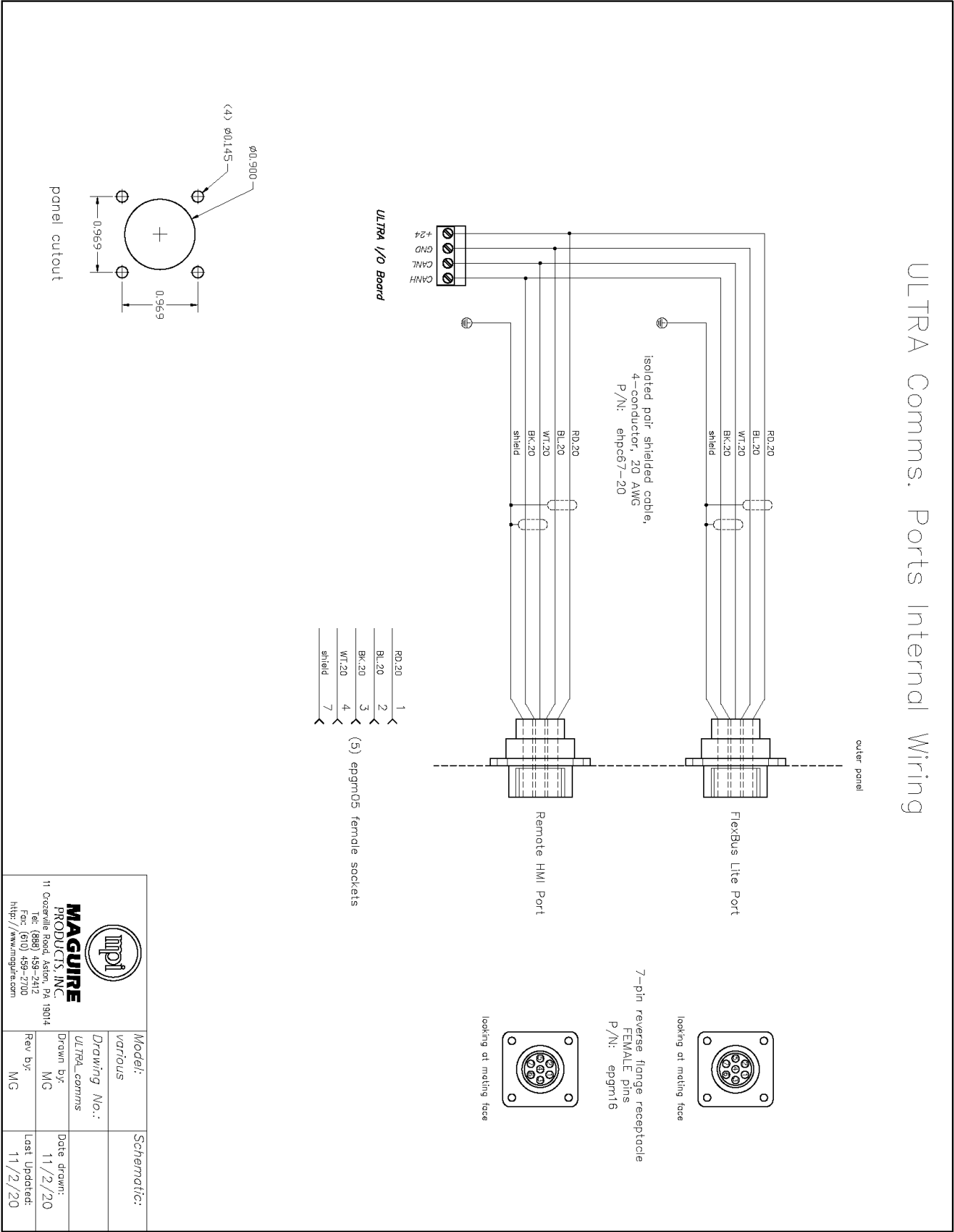
Other Potential Replacement Parts

9	es4TAT5	fuse, 60 amp class J, AJT60	electrical cabinet
10	eg-01E2	circuit breaker, 1-amp, E-trip, 2-pole	electrical cabinet
11	eg-02E1	circuit breaker, 2-amp, E-trip, 1-pole	electrical cabinet
12	eg-10C2	circuit breaker, 10-amp, E-trip, 2-pole	electrical cabinet
13	eg-30C3	circuit breaker, 30-amp, C-trip, 3-pole	electrical cabinet
14	eg-60C3	circuit breaker, 60-amp, C-trip, 3-pole	electrical cabinet
15	es3RT2016	motor contactor, 3-pole, 20A, 24 VDC	electrical cabinet
16	esCGC32D	motor contactor, 3-pole, 50A, 24 VDC	electrical cabinet
17	ehr09	relay, SS, 480V 25A, 24-265 VAC signal	electrical cabinet
18	ehr25	relay, SS, 480V 75A, 24-265 VAC signal	electrical cabinet
19	eRTD2-40-192	RTD temp. sensor, 1/8" dia. x 2-1/2" long, Pt100	heating hopper
20	eRTD2-32-352	RTD temp. sensor, 1/8" dia. x 2" long, Pt100	mat. outflow valve
21	elc100V	load cell, 100 kg capacity	retention hopper
22	elc250V	load cell, 250 kg capacity	vacuum chamber
23	esp-05	pressure switch, 60 psi set-point, 1/8" NPT	main cabinet
24	eabVBD-01	I/O circuit board	electrical cabinet
25	eabVBD-02	display / HMI circuit board	front control panel
26	eabVBD-03	pendant circuit board (.8" 4-digit numeric)	front control panel
27	ebTS-7V	touch screen	front control panel
28	nmd-09E	replacement element, for membrane air dryer	pneumatics cabinet
29	eht35-40	tube heater, 35,000 watt 3-phase 400 VAC	main cabinet
30	eht35-48	tube heater, 35,000 watt 3-phase 480 VAC	main cabinet
31	ehsl-02	strobe light, red, magnetic base, 24VDC	electrical cabinet
32	ehb-2	piezo buzzer, 24VDC	electrical cabinet
33	esw-09H	interlock handle, red/yellow pistol	electrical cabinet
34	ecf-120	cooling fan, 120mm, 106 CFM, 115VAC .24A	electrical cabinet

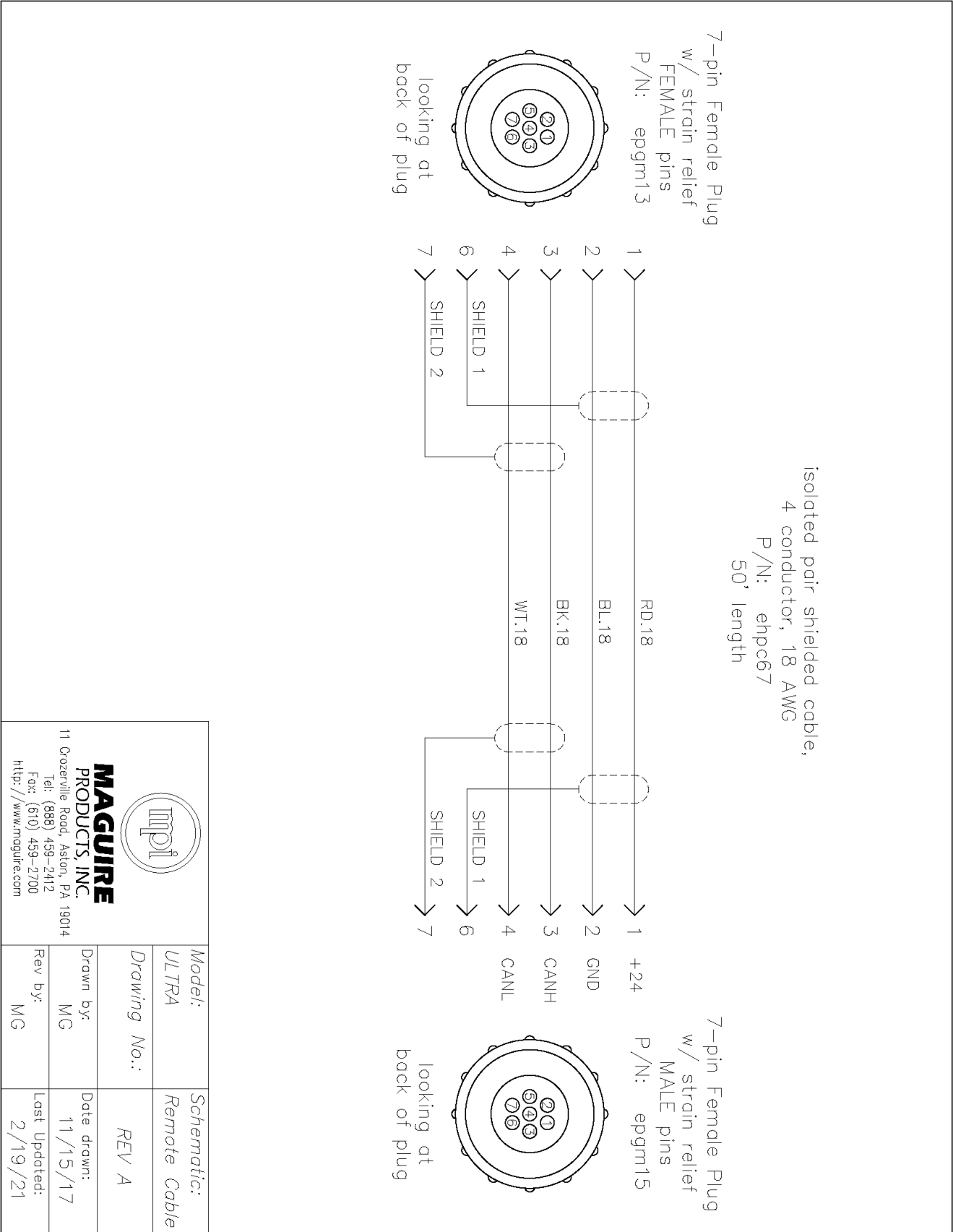
ULTRA-600/1000 Loader #1 (Upstream) Demand Signal Interrupt



ULTRA-600/1000 Communications Ports Internal Wiring



ULTRA-600/1000 Remote Cable Schematic



Disclaimers

Intended Use - The intended use of the Maguire ULTRA series of Dryers is specifically for processing and drying raw and recycled plastics materials. The Maguire dryers should not be used for applications outside of the intended use.

Production of Faulty Product - Processing conditions and materials vary widely from customer to customer and from product to product. It is impossible for Maguire to anticipate all processing conditions and requirements, or to be certain that our equipment is guaranteed in all circumstances. The customer must observe and verify the performance level of the equipment as part of the overall manufacturing process.

The end user must verify to his/her own satisfaction that this level of performance meets the proper requirements. Maguire cannot be responsible for losses due to product that is dried incorrectly, even if equipment malfunctions. Maguire Products, Inc. is only responsible to correct, repair, replace, or accept return for full refund, if our equipment fails to perform per design, or is inadvertently misrepresented for the customer's application.

Decommissioning and Disposal - Decommissioning the unit: Disconnect the unit from the power supply. Disconnect the compressed air supply. Cut all Electrical cables and Pneumatic Hoses.

Disposal: Remove air hoses and inspection glasses and dispose of with plastic refuse. Remove electric motor dispose of with metal. Remainder of unit dispose of with metal. Controller: Remove battery and dispose of battery with hazardous waste. Remainder of controller dispose of with electronic waste. Re-cycle any hazardous materials/substances in accordance with the Local & National regulations of the End User e.g., Lithium batteries etc., specific attention should be paid to the European RoHS & WEEE Directives; remove any 'sharps' and dispose of in accordance with Local & National regulations.

Accuracy of this Technical Manual - Maguire Products, Inc. makes every effort to keep this manual as correct and current as possible. However, technology and product changes may occur more rapidly than the reprinting of this manual. Generally, modifications made to the dryer design or to the operation of the software may not be reflected in the manual for several months. The date at the footer of this manual will indicate approximately how current this manual is. Likewise, a customer's dryer may have been produced at an earlier time and the information in this manual may not accurately describe said dryer, since this manual is written for the current line of dryers in production (as of the date in the footer). Maguire Products Inc. always reserves the right to make these changes without notice and does guarantee the manual to be entirely up to date. This manual assumes software version U0204A or later.

If there are any questions regarding information in this manual, or errors exist, please reach out to Maguire Products, Inc. so that necessary corrections can be made, and proper information can be provided. Additionally, Maguire will gladly provide the customer with an updated copy of any manuals at any time. Comments and suggestions are always welcome as Maguire strives to constantly improve/update this technical manual.

For additional information, or to download the latest copy of this manual or any other Maguire manual, please visit our website at <http://www.maguire.com> or contact us directly.

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